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NIMBUS-7 ERB Delmat Operators Guide and Maintenance Manual

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Prepared For:
National Aeronautics and Space Administration
Goddard Space Flight Center

Prepared By:
Research and Data Systems, Inc.
10300 Greenbelt Road
Lanham, Maryland 20706
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Task Assignment 3

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NIMBUS-7 ERB DELMAT OPERATORS GUIDE AND MAINTENANCE MANUAL

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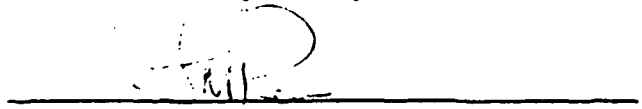
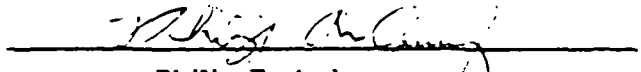
NATIONAL AERONAUTICS AND SPACE ADMINSITRATION
GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND 20771

Prepared By



Lanning Penn



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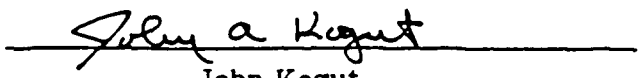

John Kogut

RESEARCH AND DATA SYSTEMS, CORP.
10300 GREENBELT ROAD
LANHAM MARYLAND 20706

Under

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The Calibration Adjustment Task is sponsored by the ERB Processing Team under the management of Dr. H. Lee Kyle (GSFC/Code 626). The software has been developed for and is operated on the GSFC SACC Computers.

References used in formulating this work will be found on pages 57 and 58.

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SECTION 1.0 INTRODUCTION

1.1 PURPOSE OF THE OPERATOR'S GUIDE AND MAINTENANCE MANUAL

This guide has been written to fulfill the following objectives:

a. To provide computer operation personnel with a description of the software and of the operational environment so that the software can be run.

b. To provide the maintenance programmer with the information necessary to understand the programs, their operating environment, and their maintenance procedures.

1.2 Method of Calibration Adjustment

Calibration adjustment of the ERB WFOV total channel (channel 12), filtered channel shortwave (channel 13), and near-infrared (channel 14) radiometers is accomplished through the application of several offset terms and a sensitivity change. The DELMAT tape contains offsets describing the sensors' responses to internal thermal gradients (termed the "midnight offset" because of the zero bias at night) and to infrared absorption and warming and subsequent re-radiation by the multiple filter domes (termed longwave heating). Also included are offsets removing the sensor's responses to stray and in-field solar insolation. The Calibration Adjustment Table, or CAT, contains global calibration adjustment slopes which vary by half-month. Additional empirically determined offsets are also provided.

1.2.1 DELMAT

The DELMAT tape contains one data month's worth of calibration adjustments for the correction of the total and filtered channel irradiances. The data month begins on the first data day of the calendar month and extends beyond the end of the calendar month to the last data day of the last ERB 6-day cycle begun in that month. Thus, up to 5 days of the next calendar month may be included. The Tape Specifications Document (Reference 1.2.21) describes the tape in detail. It is sufficient to say here that there is one physical file per data day. Each data day is as defined on the respective MAT: Data begins with the first orbit (started at the descending node) of the day (started at 00:00:00 GMT) and

ends with the completion of the last orbit (ended at the descending node) of the day (ended at 23:59:59). Neglecting data gaps, more or less than 24 hours of data will exist in the day due to the 104 minute orbital period of the Nimbus-7 spacecraft.

The DELMAT is designed to complement, rather than replace, the MAT. Therefore, an extensive amount of data, not pertinent to the calibration adjustment problem, does not exist on the DELMAT, though it is available on the MAT. What is retained, however, is a set of record identifiers and time tags, enabling the matching of a DELMAT record to the corresponding MAT record. Once a match has been made, instrument status words are checked, as well as the data quality loss interval flags and general data quality (the DELMAT contains a summary status word) and the appropriate parameters extracted from each tape. The DELMAT calibration adjustments are additive. Where questionable data is encountered, the DELMAT software employs interpolation algorithms (spline fit for small gaps, trend-matched zonal averages for large gaps) to replace the data.

Although Channel 12 is normally used as the operational total channel, provision exists in the software to use channel 11 (see section 3.1e). A low-pass, 3-point (0.25, 0.50, 0.25) filter is also employed to identically remove an inherent every-other-observation oscillation in the data. To the user of the irradiances there exist three options within the DELMAT record; the use of the uncorrected irradiances, the use of the uncorrected irradiances with the calibration adjustments added, or the use of the corrected irradiances.

Three versions of DELMAT tapes produced by three corresponding versions of DELMAT software currently exist. Version 1.0 produced by the corresponding version of DELMAT software was used to process data from May, 1980 through October, 1981. Version 2.0 software was used to process data from November, 1981 through October, 1983. Version 3.0 software, used to process data after October, 1983, is being used to reproduce DELMAT's for the prior time period. This manual reflects the most recent changes to the version 3.0 software.

1.2.2 CAT

The Calibration Adjustment Table (CAT), contains empirically determined slopes and offsets to be applied to each WFOV channel. For channel 12 this involves an offset (required by revised estimates of the configuration factor of the channel) of 12.6 W/m^{-2}, a baffle enhancement factor of 0.963, and a time-dependent slope (determined by solar pitch-maneuver calibrations). For channel 14 this also involves a time-dependent slope (determined by solar pitch-maneuver calibrations). For channel 13 this involves a slope which varies with modified

solar zenith angle *(to account for inhomogeneities in degradation) and day (to account for time-dependence). Bi-linear interpolation to the observation can be employed. An offset is also provided which varies as a function of time only. Comparisons against the total channel 12 over the entire globe were used for the determination of these calibration adjustments.

1.3 Summary of DELMAT Corrections

1.3.1 Midnight Offset

1.3.1.1 Description

The midnight offset correction is provided to remove the zero bias evident at night from each of the two filtered channels. A midnight point is defined for each orbit as that point in the orbit furthest from the sun (maximum solar zenith angle). At this point the calibrated signal is extracted from the shortwave and near-infrared radiometers. The former is corrected for longwave heating, and both for shortwave heating. In general, from 13 to 14 data points, (one per orbit), are obtained for each day. A cubic spline is fitted to these points and evaluated at every observation.

1.3.1.2 Assumptions

It is not assumed that the spacing of three shortwave-heating time constants between the sunblips and the midnight points renders the shortwave heating contamination of the midnight offsets neglible. A small constant bias correction is thus applied for the purpose of removing this weak contamination (0.9 W/m^2 for Channel 13, 1.5 W/m^2 for Channel 14). Information from adjoining days is not included in the spline fit for the day under consideration. A constant value of the midnight offset is applied prior to the first midnight point and after the last midnight point to avoid extrapolation. Estimates of longwave heating are removed from the channel 13 midnight values to yield an independent correction for zero bias. Because of the one-data-point per orbit curve fit, the smallest oscillation that can be represented has a period of two orbits; the primary correction is the removal of the ERB duty cycle.

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* To make the solar zenith angle a unique descriptor of orbit position, it is multiplied with the sign of the rate-of-change of the solar zenith angle.

1.3.2 Longwave Heating

1.3.2.1 Description

The longwave heating offset correction is provided to remove the variable channel 13 sensor response to infrared radiation. A constant response correction has already been applied in the count-to-irradiance calibration equation. It has been shown that there is no significant "longwave leak" through the pair of Suprasil-W filter domes. Instead, the outer filter dome is subjected to a time-varying incident longwave radiance field, modulated primarily by the equator-to-pole terrestrial thermal gradient. This produces a temperature response in the dome with a corresponding change in the amount of emitted longwave radiation. Some of this radiation is absorbed by the inner filter dome, which changes temperature and radiates, in part, onto the exposed radiometer. Unless corrected for, this response is assumed to be due to incident shortwave radiation.

1.3.2.2 Assumptions

Laboratory studies on a prototype channel 13 radiometer, inflight studies on the N-6 ERB channel 13, as well as 2 years of data on the N-7 ERB channel 13 all indicate that the double-dome longwave heating response is well represented by a single point convolution of impulse response and longwave forcing. Based on empirical studies, a time constant, or phase lag, of 21 major frames (approximately 5½ minutes) is used along with a sensitivity of 4 percent. It is assumed that this longwave heating response, based on the first 2 data-years, does not change with time. The longwave heating response of channel 14, with 3 filter domes, is assumed to be negligible.

1.3.3 Shortwave Heating

A large body of studies have shown that a shortwave heating response is present in, at least, the filtered channel 13 and 14 irradiances. This is most evident following the sunset sunblip, where pseudo-exponential decay curves with time constants of 20 and 30 major frames respectively for channels 13 and 14 are observed. Through some geometric simplifications, the amount of shortwave forcing can be computed, allowing the determination of appropriate sensitivities. These are noted to generally increase and decrease for channels 13 and 14, respectively, with time as the channels degrade.

What is uncertain is in the transfer of this model from direct solar to terrestrial-reflected solar radiation. Because this effect proved impossible to properly replicate under laboratory conditions, this model was not implemented to describe terrestrial reflected shortwave heating response. In version 1.0 and 2.0,

the shortwave heating correction for both channel 13 and 14 is set to zero. In version 3.0, the direct solar correction is used, while the terrestrial-reflection correction is set to zero.

1.3.4 Clipping

In the version 3.0 DELMAT, two additional corrections are added, and they are jointly referred to as clipping corrections. The first involves the interpolation across, or "clipping" of, all sunblips. Using a tensioned spline interpolation, the measurements of channels 12, 13, and 14 are estimated for the region between solar zenith angles 99° and 121°. The difference between these interpolated values (with all other applicable corrections applied) and the original sunblip irradiance is stored for each channel as the clipping correction. In addition, after all applicable corrections are applied, all channel 13 and 14 irradiances at solar zenith angles greater than 121° are set to zero. The difference between these corrected irradiances and zero are also stored as clipping corrections.

The irradiances for Channels 12, 13 and 14 are contaminated by reflected solar radiation (stray light) in the solar zenith angle range 90-99°. Since observations in this area are used in the sunblip interpolation, they are reduced by a solar zenith angle dependent quantity to eliminate the contamination prior to sunblip clipping.

SECTION 2.0 APPLICATION

Description

2.1.1 PDELTA

This program is intended to read the Nimbus-7 ERB MAT's and generate as output the corresponding PDELTA tape files and a printed listing providing some quality control statistics for the data. It also updates a disk file for the appropriate calendar day to enable interfacing with the monthly merge software.

2.1.2 DELMAT

This program merges a month* of PDELTA files onto one tape with a generated header file and a trailing documentation file (TDF) which is a collection of all MAT headers/TDF's processed for that month.

2.1.3 Functions

2.1.3.1 PDELTA

Every run of the PDELTA preliminary calibration adjustment software can operate on from one to thirty-six MAT's. The run is controlled by the set of card images read in at the start of execution. These include a set of print option flags, the VOL/SER and date of the output PDELTA tape and the VOL/SER and expected sequence number of each input MAT. These are explained further in section 3.1.1 (Input).

Every run updates the monthly table file containing VOL/SER, date, and file information, which provides the interface between the DELMAT and PDELTA tapes (or between the PDELTA and DELMAT software). These are explained further in section 3.3 (Output).

After accessing the JCL and table files, the software then processes each input MAT in turn, creating a pair of output files (preliminary TDF and data) on the appropriate output PDELTA tape. After each successfully processed MAT, the monthly table file is updated. Any critical errors encountered in processing an individual MAT result in the termination in the processing of that MAT. The software then begins processing the next input MAT.

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*A data-month is extended by five days to allow the completion of the final data cycle (6 days) begun in the calender month.

For each input MAT of the run, the following functions are performed:

a. Read a Nimbus-7 ERB MAT header file and create a preliminary TDF on the output PDELTA tape.
   1. Read each of two header records and compare them.
   2. Verify from header that input tape is a Nimbus-7 ERB MAT.
   3. Verify that the expected MAT has been mounted.
   4. Create the TDF record and write the preliminary TDF to the PDELTA tape.

b. Position the MAT to file 2 and place all observations and ancillary data into core.
   1. Position the MAT to the beginning of file 2.
   2. Read in physical records of data.
   3. Locate appropriate logical records.
   4. Drop MAT filled records.
   5. Pull necessary data from input array.
   6. Compute modified time in seconds.
   7. Compute solar ephemeris.
   8. Compute solar zenith angle.
   9. Quality control the data for this major frame.
   10. Compute modified instrument status word.
   11. Place appropriate observation vector into core.

c. Locate all data gaps and periods of anomalous instrument behavior and interpolate.
   1. Place dummy data before start and after end of data.
   2. Check time intervals between successive observations for missing data.
   3. Place dummy data into data gaps.
   4. Check status workd for anomalous data.
   5. Store start and stop indices of each data gap/anomalous data region.
   6. Apply low-pass filter to irradiance data within valid data segments.
   7. Determine if data gaps can be filled - must not be near solar blip, at the start or stop of data, or too large.

8. If fillable, interpolate data across gap/anomalous data regions.
9. Interpolate irradiances.
10. interpolate right ascension.
11. Interpolate declination.
12. Interpolate solar zenith angle.
13. Update instrument status word.

d. Find and apply midnight offsets to the filtered channel irradiances.
   1. Locate solar zenith angle maxima for preliminary midnight offsets.
   2. Locate corresponding longwave heating term.
   3. If both exist, e.g. no uncorrected data gaps, store data point for each orbit.
   4. Interpolate between successive midnight offset points to each data point.
   5. Subtract midnight offset term, less longwave heating effect, from the irradiances.

e. Determine zonal average climatology.
   1. Determine the along track angle
   2. Average irradiances by bin for each orbit .
      a) Produce bin averages orbit-by-orbit.
      b) Average orbital bins together, neglecting individual non-zero bin populations.

f. Compute composite persistance/zonal average.
   1. First use zonal averages.
   2. Only use persistance if zonal average method fails in one or more bins for this day due to insufficient valid data.

g. Fill all large data gaps.
   1. Operate on each channel 13/14 data gap.
      a) Compute/simulate the S/C ephemeris.
      b) Compute the solar ephemeris
      c) Compute the solar zenith angles.
      d) Substitute the zonal average irradiances.
      e) Update the instrument status word.

2. Operate on each channel 12 data gap.
    a) Substitute the zonal average irradiances.
    b) Update the instrument status word.

h. Compute and apply the longwave heating corrections.
    1. Determine the location of the phase-shifted point.
    2. Compute the longwave radiation
        a) Longwave radiation during night is computed from the channel 12 irradiances.
        b) Longwave radiation during day is computed from the channel 12 and 13 irradiances.
        c) Longwave radiation during twilight is interpolated from night and day boundaries.
    3. Determine the product of sensitivity and longwave radiation.

i. Compute and apply shortwave heating corrections.
    1. Compute shortwave heating response.
    2. Compute and apply shortwave heating corrections.

j. Compute clipping corrections.
    1. Set all nightime channel 13 and 14 irradiances to zero.
    2. Interpolate across or "clip" sunblips, correcting for out-of-field response.
    3. Apply and record all clipping corrections.

k. Compute and write to disk Global averages for CAT generation.

L. Form output records and write to PDELTA tape.
    1. Rewind MAT.
    2. Read in physical records and position to each logical record.
    3. Check for orbital and daily summaries on MAT.
    4. Compare major frame start time to observation times.
    5. Throw out dummy data.
    6. Form PDELTA logical record which matches MAT physical record.
    7. Write PDELTA record to output tape.

2.1.3.2 DELMAT

The DELMAT software uses as input one or more PDELTA tapes and a Table File providing a directory of locations of PDELTA files for the calendar days to be processed. Input guidance supplied on disk controls the header generation and provides the location of the output tape.

The DELMAT software does not affect the ERB data. It only: repositions the data; provides a new header; stacks the months' data consecutively; and accumulates the individual TDF's, placing them at the end of the completed DELMAT tape.

2.2 Operation

The intergration of the PDELTA and DELMAT software into the overall ERB process is illustrated in Figure 1. Beginning with a month of ERB MAT tapes, two PDELTA tapes are produced. As a by-product of this process, calibration statistics and generated. The two PDELTA tapes are merged into one DELMAT tape using the DELMAT software. The DELMAT tape and the calibration statistics as well as the original MAT's are then used in ERB Level-2 processing, eg., SEFDTFIX and MATRIX. No security is required for this software.

2.3 Equipment

This software is designed to be used on the SCF IBM 3081 computer system.

2.4 Structure

The structure of the PDELTA software is illustrated in the subroutine flow chart (Figure 2). The structure of the DELMAT software is illustrated in Figure 3. The purpose of each subroutine is discussed below:

2.4.1 PDELTA

MAIN	The main driver of the program.
ANGLE	This routine computes the along-track angle (ATA) of the satellite, its ascending/descending status and places an observation into one of 720 bins based on the ATA.
BLOCK DATA	This is simply a storage location for data statements which may in the future be updated.
CHKISW	Given the observation corresponding to midnight it locates the observation 21 major frames before. If the instrument status word of either of these observations is non-zero, it hunts for neighboring major frames with a zero status word.

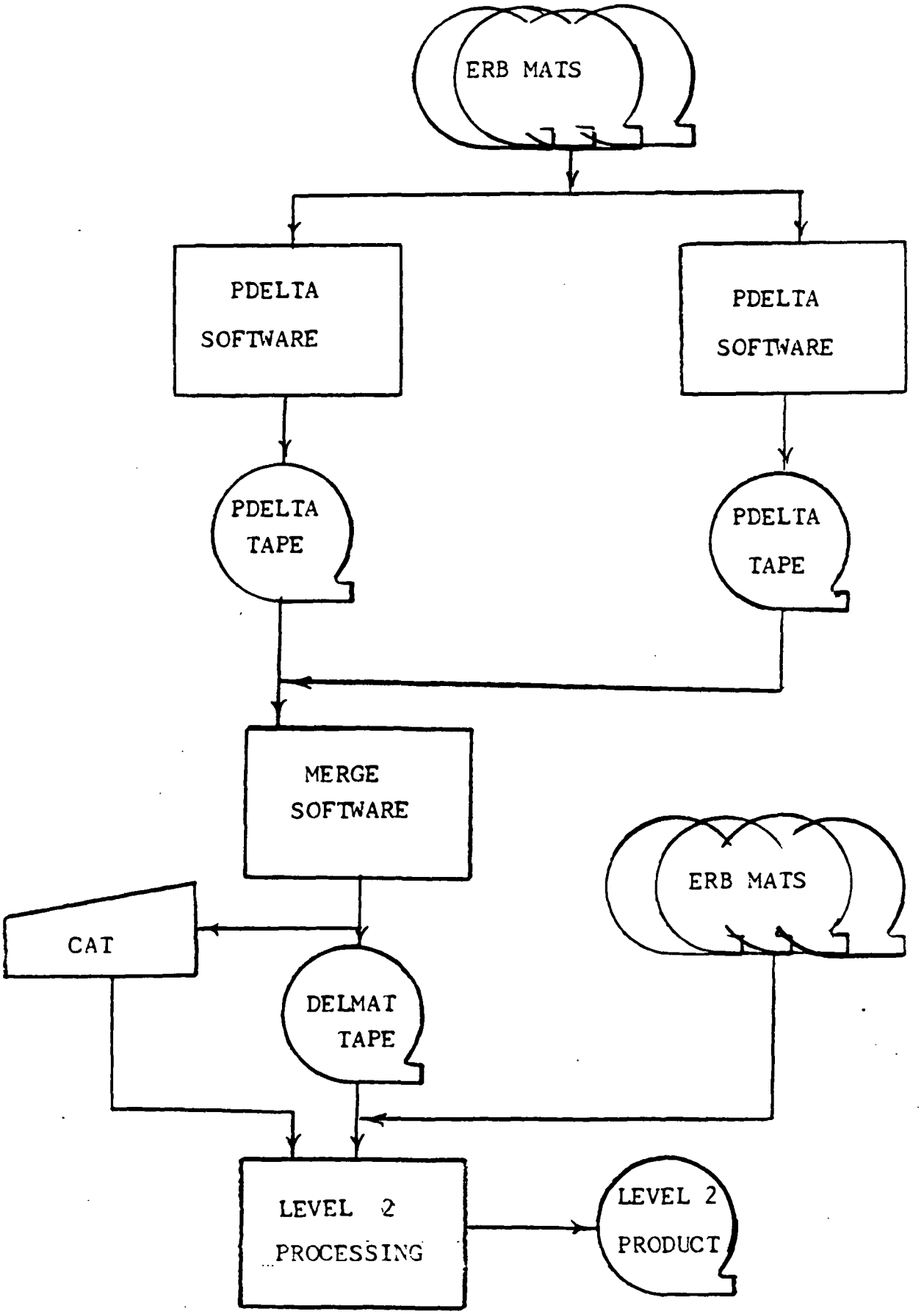


Figure 1 Schematic of PDELTA and DELMAT Software.

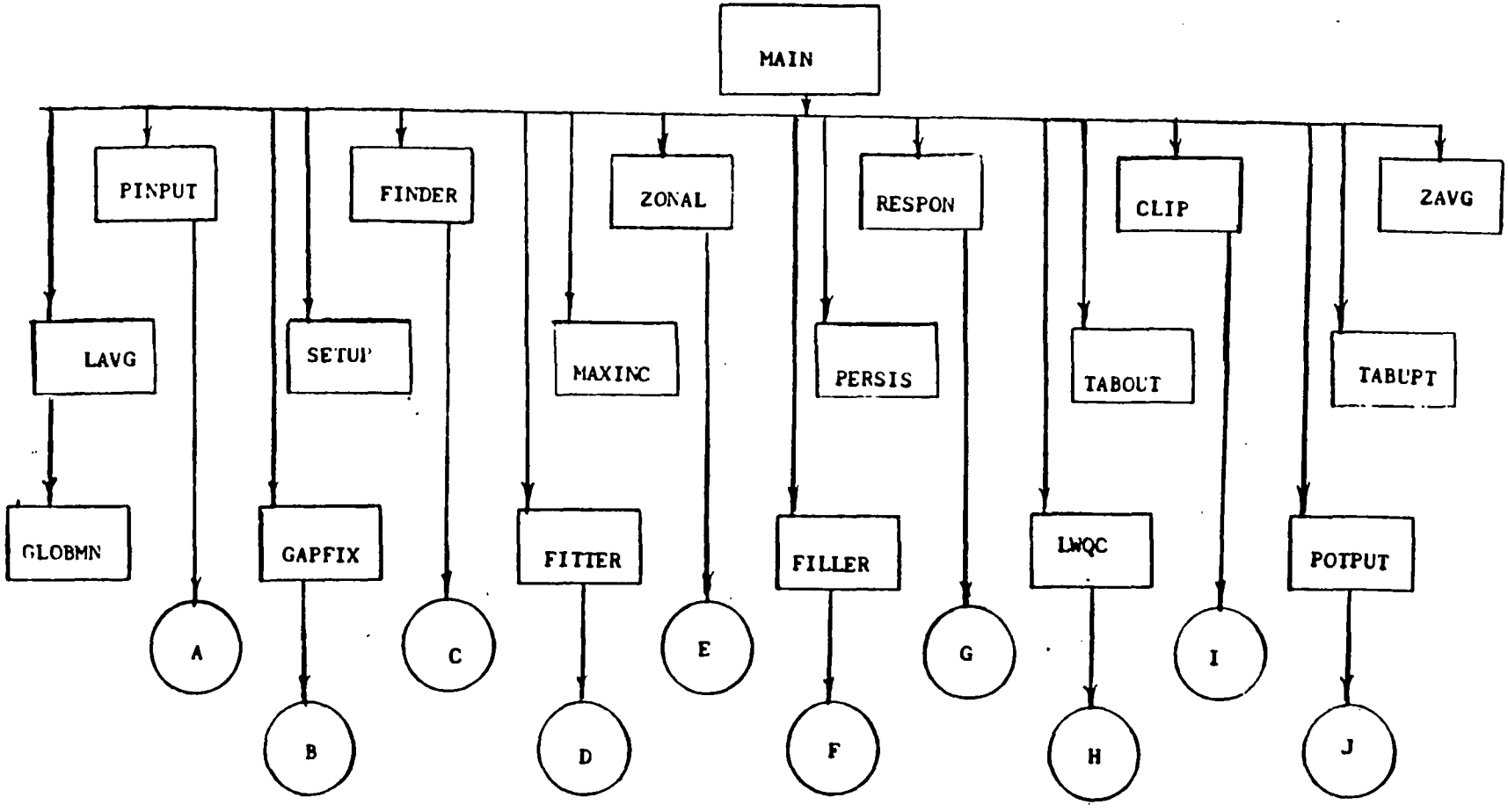
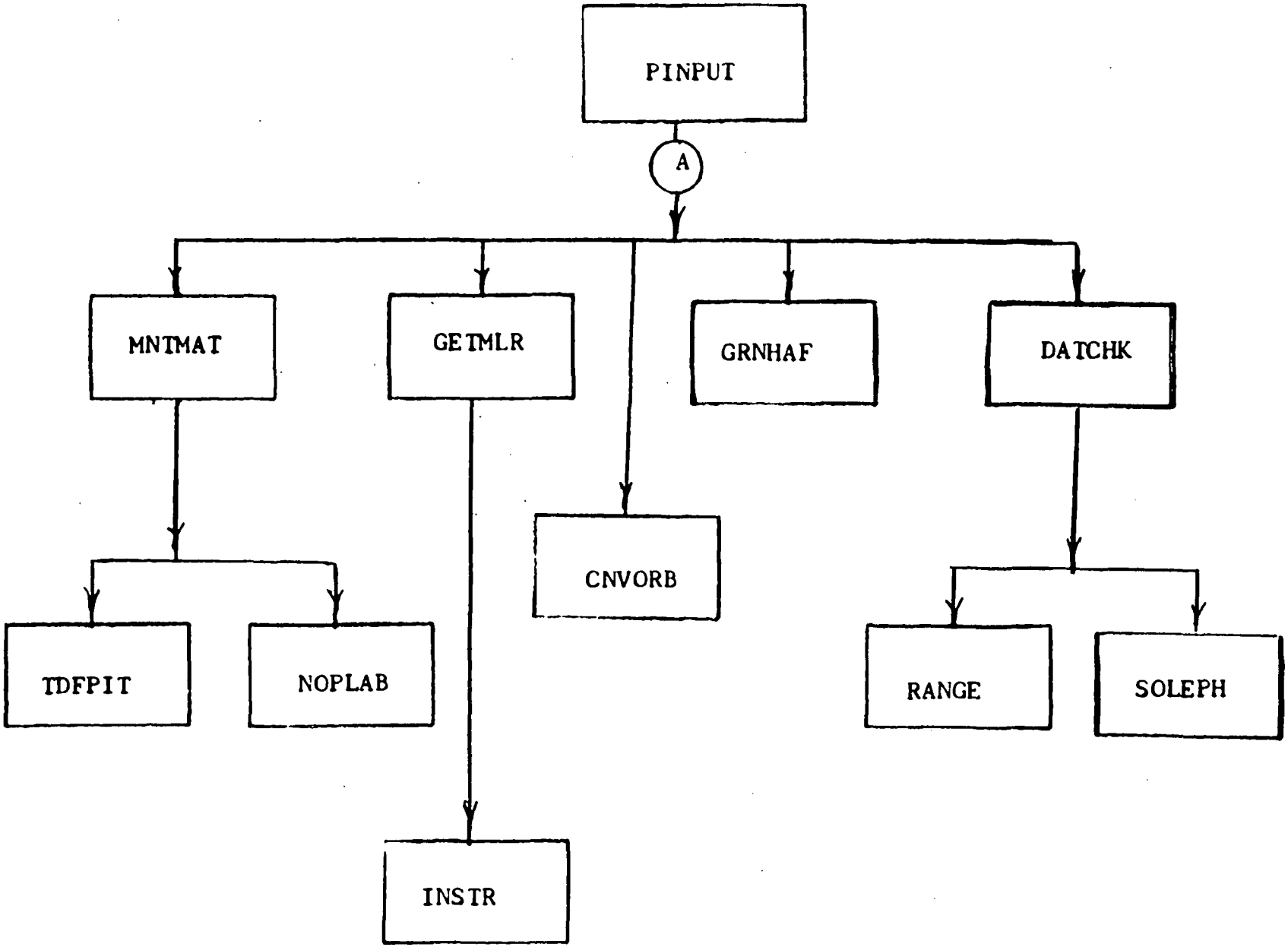


Figure 2 Schematic of DELTA Software



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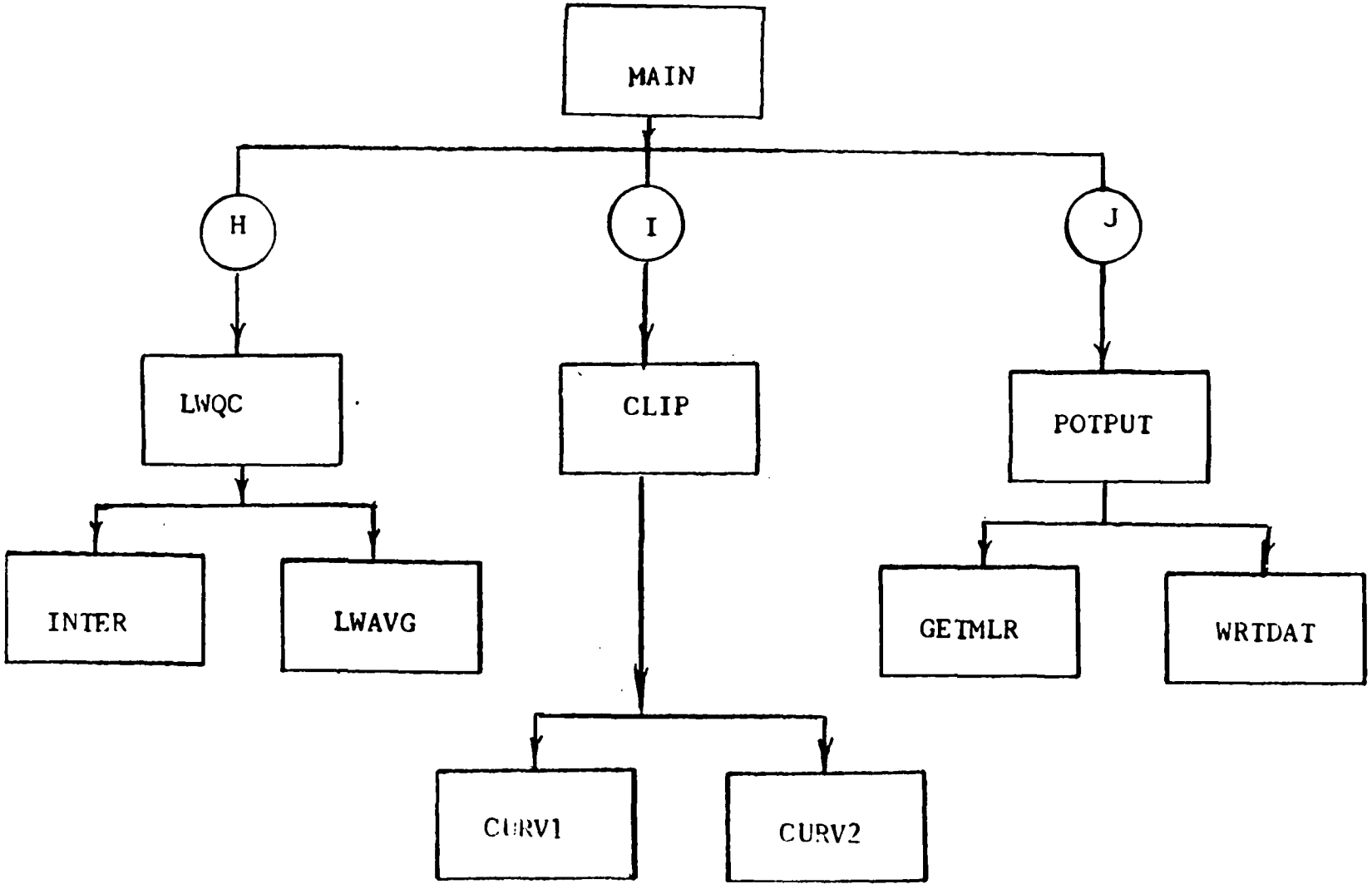

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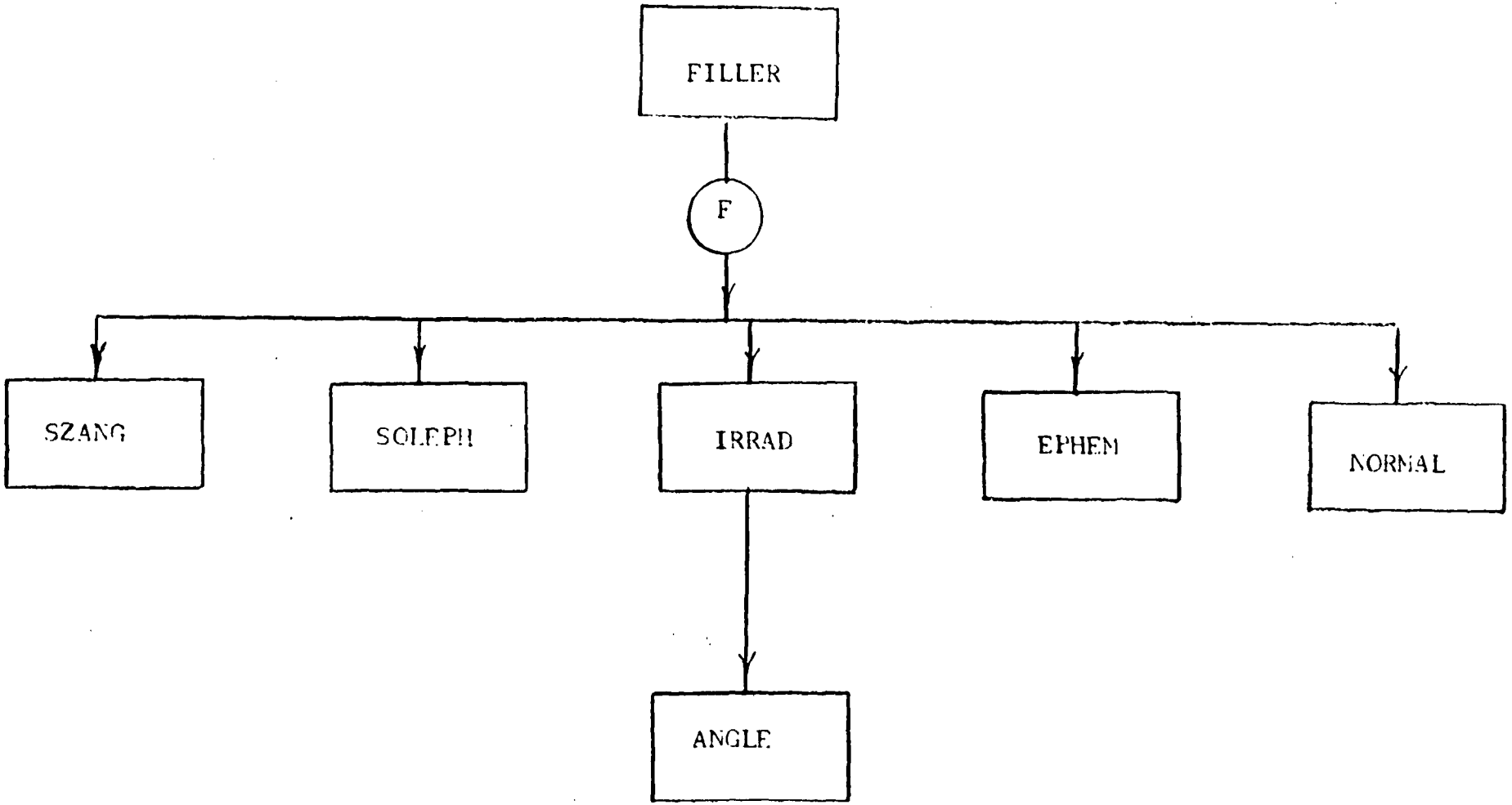

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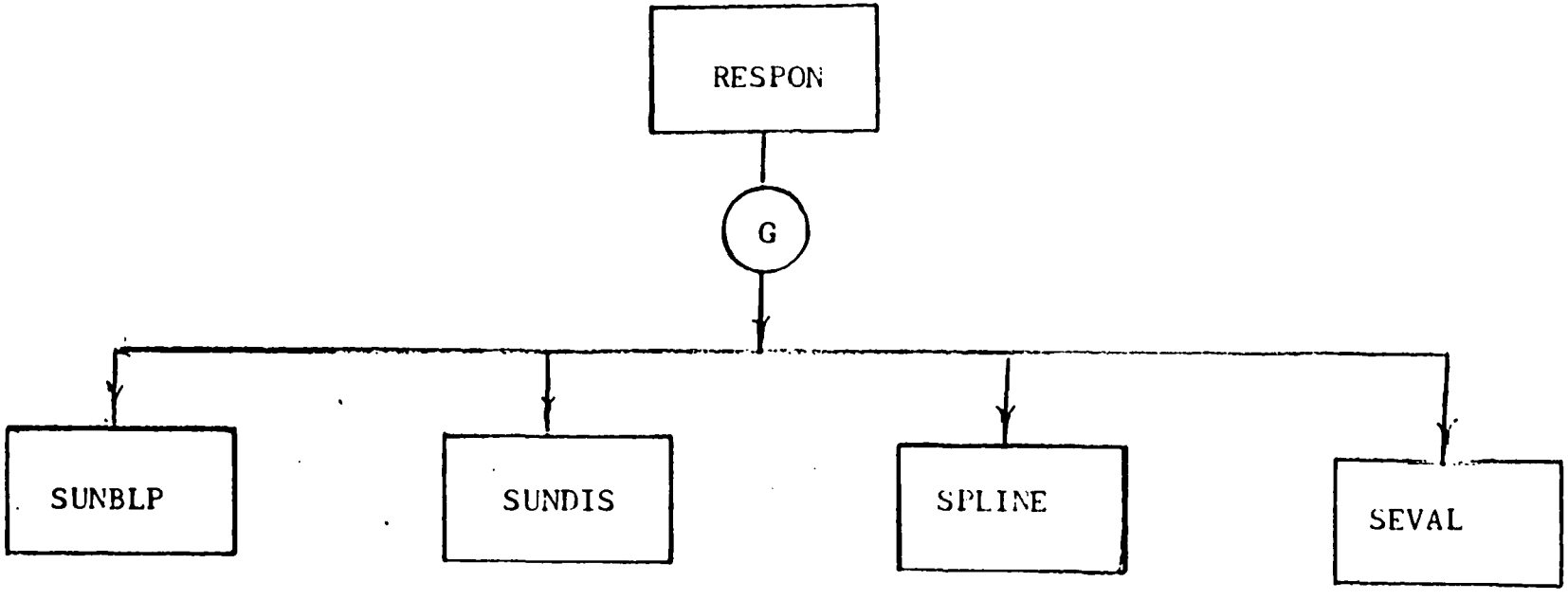

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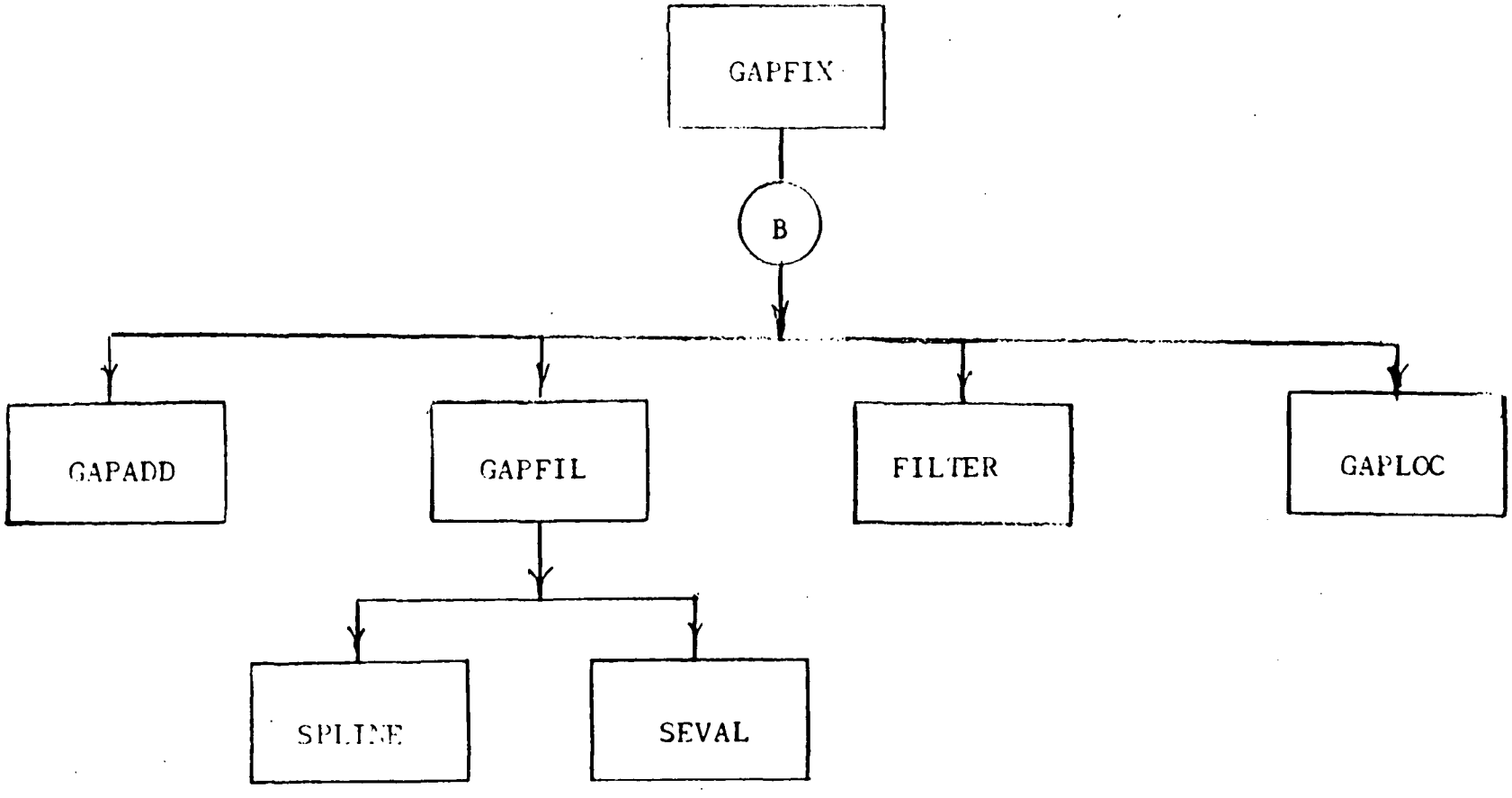

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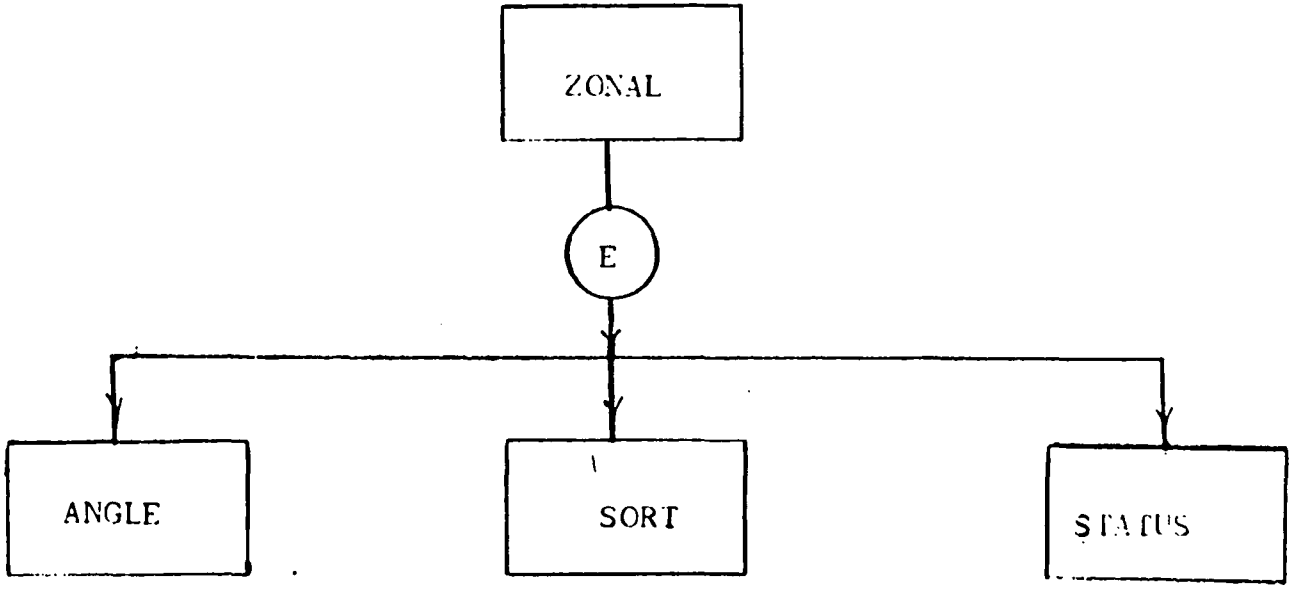

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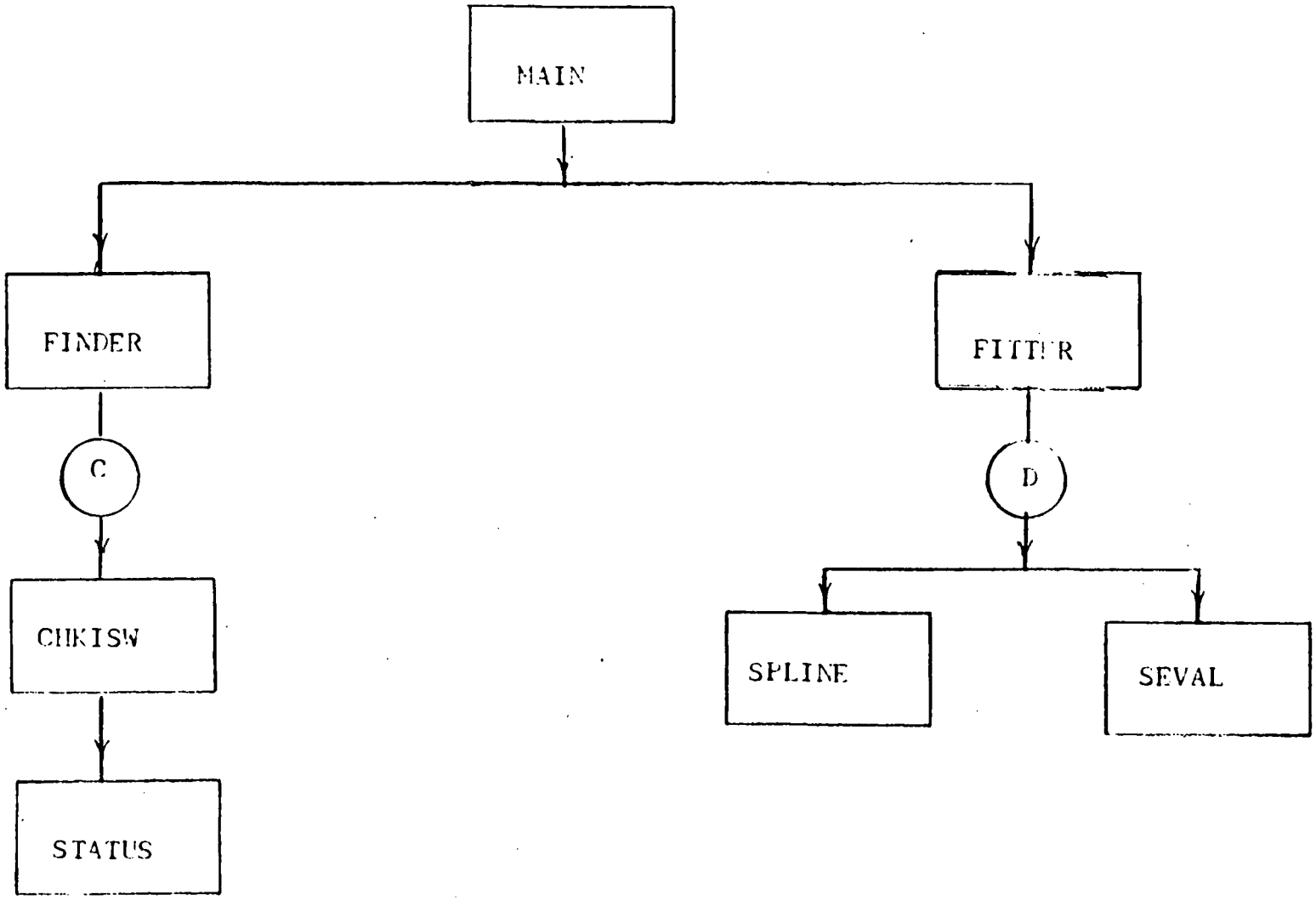

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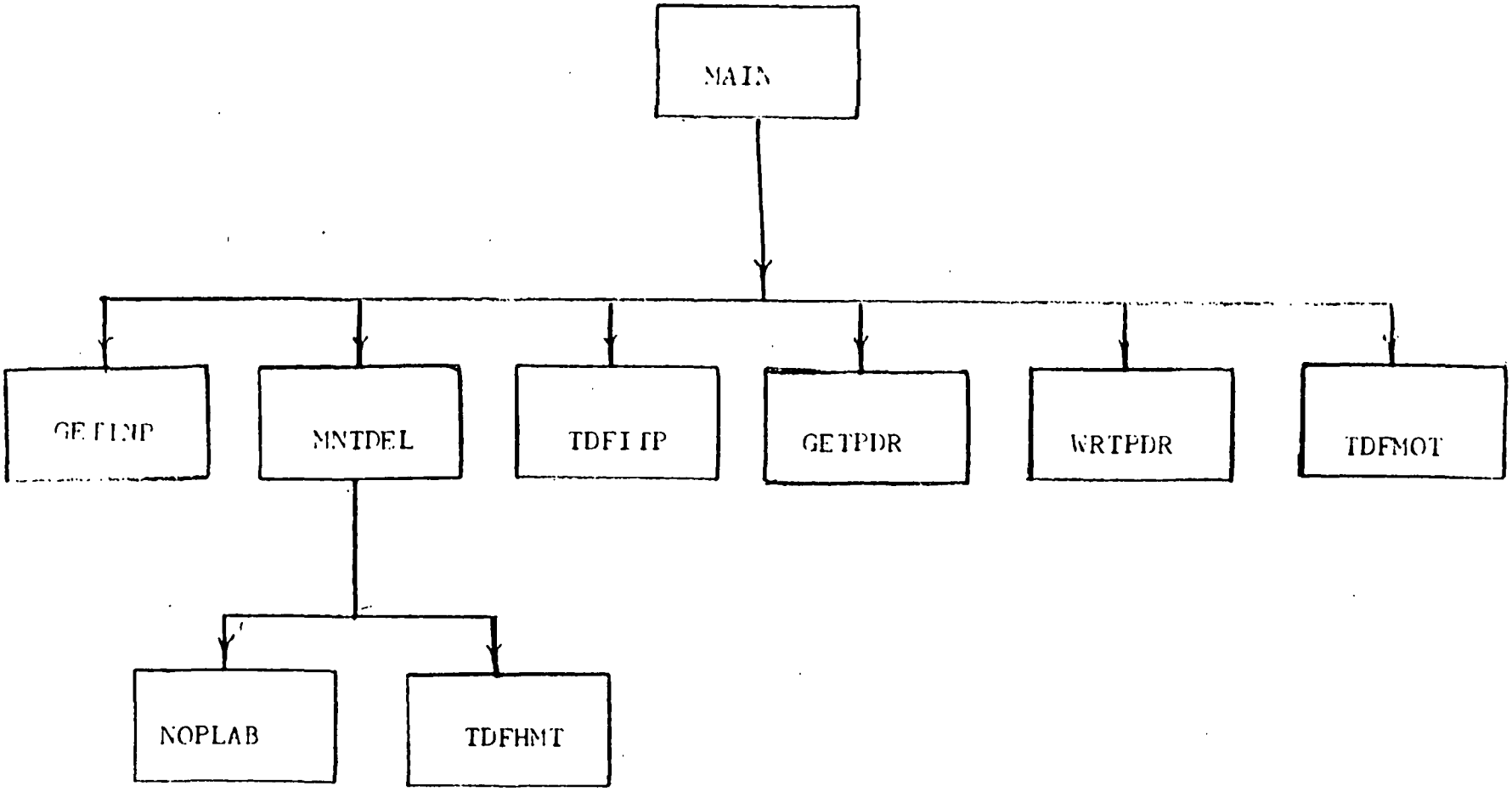

Figure 3 DELMAT Software Structure

CLIP	Sets nightime channel 13 and 14 irradiances to zero and interpolates across sunblips
CNVORB	Converts all negative orbit numbers (after March 1985) to correct orbit numbers when I*2 overlow occurs.
CURV1	Computes a tensioned spline fit
CURV2	Applies the above spline to intermediate values.
DATCHK	Performs quality control checks on irradiances from each major frame of the day and assigns the appropriate instrument status word. It then computes satellite ephemeris data for the good observations.
EPHEM	Controls the filling of all large data gaps with spacecraft simulated ephemeris.
FILLER	Controls the filling of all large or otherwise unfilled data gaps by substitution of climatological data.
FILTER	Performs a low-pass filtering of one days WFOV irradiance data.
FINDER	Determines the set of midnight points (satellite SZA is a maximum) for a MAT day.
FITTER	Produces a cubic spline interpolation of the days midnight offset corrections and assigns a correction to each observation of the day.
GAPADD	Adds a specified number of simulated observations to the beginning and end of each MAT day. These observations are considered to be a data gap, and are filled accordingly.
GAPFIL	Fills small data gaps by interpolation.
GAPFIX	Controls overall processing of data gaps.
GAPLOC	Determines endpoints of data gaps for channel 12, 13, and 14 irradiances.
GETMLR	Reads a physical record from a MAT tape and copies its contents into an array.
GLOBMN	Computes area-weighted Global averages of DELMAT parameters for each day; and writes to disk.
GRNHAF	Computes the Greenwich hour angle given a date and time.

INSTR	Recomputes MAT instrument status word. After scanner failure, MAT contained contaminated instrument status words.
INTER	Performs a linear interpolation using the SZA to determine the replacement maximum or minimum longwave heating value that is appropiate should an "out-of-range" longwave heating observation be encountered on the DELMAT.
IRRAD	Uses zonally averaged irradiances to fill selected data gaps.
LAVG	Computes latitude-band averages of DELMAT parameters, used for QC.
LWAVG	Computes an appropriate maximum and minimum value for longwave heating for a given Julian day.
LWQC	Quality controls channel 13 longwave heating correction on those days when channel 12 data has been replaced by zonally averaged irradiances.
MAXINC	Finds the satellite inclination for the day.
MNTMAT	Mounts a MAT tape and verifies that it is the tape specified.
NOPLAB	Reads the NOPS standard header for each day's MAT and compares it to the information provided to ensure the proper MAT is being processed.
NORMAL	Normalizes mean zonal irradiances when these are used to fill data gaps. This accounts for the trend in the data bounding the gap.
PERSIS	Determines if any ATA bins of daily mean zonal irradiances contain an insufficient number of samples to be representative. If not this routine replaces those bins with persistance values (if available).
PINPUT	Controls selection and mounting of MAT tape. Obtains MAT records from tape and fills the main working array with the entire day's observations.
POTPUT	Matches MAT tape format to PDELTA format to ensure one-to-one correspondence between MAT and PDELTA records. Controls output of PDELTA records.

RANGE	Screens out anomalous irradiance observations which differ by a given amount from a linear fit among all observations in a major frame.
RESPON	Computes and applies the longwave heating correction (channel 13).
SETUP	Reads in job controlling input data and positions the output (PDELTA) tape.
SEVAL	Evaluates a cubic spline function for any given values.
SOLEPH	Calculates solar ephemeris data for a given day.
SORT	Sorts irradiances into ATA bins and produces daily averaged irradiances by bin for the day.
SPLINE	Produces the coefficients of a cubic spline fit among a given set of points.
STATUS	Breaks down the instrument status word into its constituent parts and determines whether a major frame has been filled for channel 12 or channels 13/14.
SUNBLP	Sets up the eight data knots of longwave irradiance prior to interpolation across a sunblip.
SUNDIS	Computes the Earth-Sun distance given the day and time.
SZANG	Controls the filling of all large data gaps with solar zenith angles.
TABOUT	Converts PDELTA table file data to EBCDIC and writes to disk.
TABUPT	Updates PDELTA tables file for each processed day.
TDFPIT	Extracts and accumulates MAT Tape Header and TDF file data.
WRTDAT	Creates PDELTA data records and writes them onto the PDELTA tape.
ZAVG	Computes solar zenith angle band averages of DELMAT parameters. Used for QC.
ZONAL	Computes zonal average irradiances for each MAT day as a function of ATA.

2.4.2 DELMAT

MAIN	Controls the merging of two or more PDELTA tape files into one DELMAT tape.
GETINP	Reads in data file and table file and sorts PDELTA files into chronological order.

BLOCK DATA	Contains data statements used throughout the DELMAT program, those most subject to change or update.
MNTDEL	Mounts the output DELMAT tape and controls the header creation.
NOPLAB	Creates a NOPS standard header for the DELMAT tape.
TDFHMT	Writes the NOPS header to the DELMAT tape.
GETPDR	Reads a physical record from a PDELTA tape.
WRTPDR	Accumulates PDELTA records until a DELMAT record is full, sets the most and least significant continuation bits and writes a physical record to the DELMAT tape.
TDFITP	Reads TDF from PDELTA tape(s) and accumulates them to form the DELMAT TDF.
TDFMOT	Writes the DELMAT TDF to the DELMAT tape.

2.5 Performance

a) The DELMAT software requires the following CPU time and EXCPS per MAT day processed

	CPU	EXCPS
PDELTA	19 sec	8000
DELMAT	1 sec	2700

b) There are no error sources within the software. Incorrect tape mounting or handling at SCF occasionally results in job failure.

2.6 Data Base

See Section 3.1.

2.7 Inputs/Outputs

See Sections 3.2 and 3.3.

3.0 Procedures and Requirements

3.1 PDELTA

3.1.1 Input

3.1.1.1 Data File (Figure 4)

The data file provides the input information for the PDELTA run. A line by line breakdown of its contents follows. This file is stored on disk.

a) Line 1. This line begins with the word "PDELTA" followed by the VOLSER of the PDELTA output tape and the date (year/month).

b) Lines 2 through n. These lines provides information on each MAT tape to be processed, each line corresponding to one MAT day. The line begins with the word "MAT" followed by the VOLSER of the MAT, the date (year/month/day), the MAT sequence number, the relative position of the day on the 3-day MAT, and a tape status index (1 = mount new MAT, 0 = retain old MAT).

c) Line n+1. The line provides default midnight offset information. This would include the Julian day followed by 12 default values for midnight offset. "999" indicates default offsets are not to be used.

d) Line n+2. This line provides channel 13 and 14 base sensitivities, and the ratio between the sunrise and sunset sensitivity.

e) Line n+3. This line provides (in order) the channel 11 and 13 day slopes, day offset and the Channel 11 night slope and offset for the optional use of Channel 11 as the operational ERB total channel. The last two digits (11 or 12) indicate which channel is used. If "12", conventional channel 12 data is used. If "11", the above regression slopes and offsets are used to simulate channel 12 data.

f) Line n+4. This line provides output options for the PDELTA. Each digit in the 70 columns refer to one output option (1 = execute option, 0 = ignore option). These options are detailed in Section 3.3.1.

```
PDELTA    BSG408          8506
MAT       JRW289        850612      51631-  1  1
MAT       JRW289        850613      51631-  2  0
MAT       JRW289        850614      51631-  3  0
MAT       JRW290        850615      51661-  1  1
MAT       JRW290        850616      51661-  2  0
MAT       JRW290        850617      51661-  3  0
MIDN      999
SENS      00205000110000000000000230
CH11      10072-0186251007700000612
OUTPUT    11010100001110001000101100000000001110001101010000010010110110000000000
```

Figure 4 Data File

3.1.1.2 Table File (Figures 5 & 6)

a) The Table File consists of 36 identical lines, one for each potential day of a DELMAT month. A DELMAT month includes enough of the following calendar month to permit completion of any 6-day cycle. This file is stored on disk.

b) Figure 5 shows a Table File prior to running a PDELTA job. Figure 6 shows a Table File after a PDELTA task is complete. Each line contains the following information: the date (year/month/day) and VOLSER of PDELTA tape on which that day's data appears; the file of the PDELTA tape on which that day's information is found; and the date (year/Julian day) the PDELTA run was completed.

3.1.1.3 PDELTA Job Control Language (JCL) (Figure 7)

This JCL will permit a PDELTA run on an IBM 3081 computer. It contains the following information of concern to the user:

a) Load module containing PDELTA code (lines 40 & 50).

b) Disk data set containing Data File (line 70)

c) Disk data set containing Table File (lines 170-200).

d) Disk data set to receive Global averages for CAT generation (line 210).

3.1.2 Job Initation

a) A PDELTA month normally contains 25-27 ERB-on days if the duty cycle is 3 days on/1 day off. For full-time operation, up to 36 days exist. It is normally divided into 4 to 6 PDELTA runs of 6 to 7 days each. This requires 4 to 6 data files. Normally 2 to 3 PDELTA runs write to one PDELTA tape; thus two PDELTA tapes are produced for each month.

b) A PDELTA tape no-label, 6250 BPI.

c) Once the tapes have been mounted and the data sets described in Section 3.1.1 have been created, the job is ready to be run.

3.2 DELMAT

3.2.1 Input

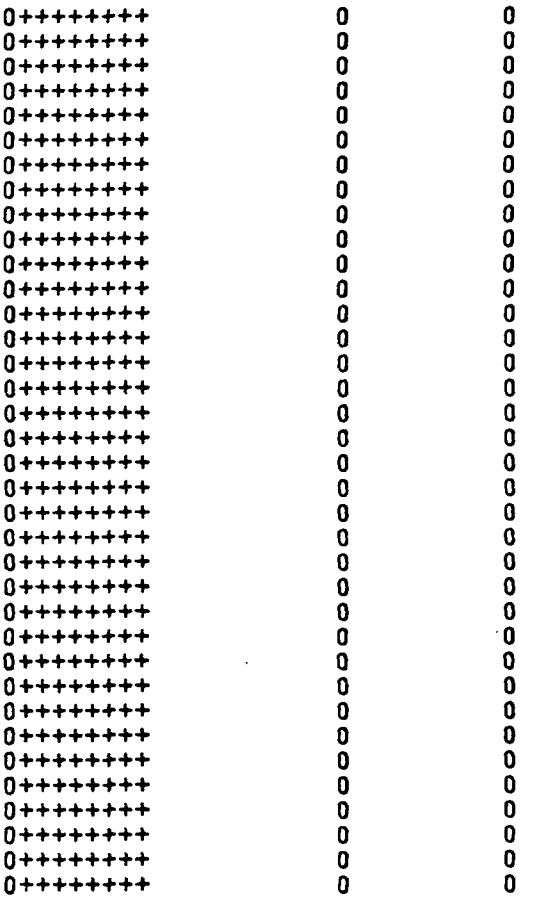

Figure 5 Table File

850601BSG408	1	86059
850602BSG408	3	86059
850603BSG408	5	86059
850604BSG408	7	86059
850605BSG408	9	86059
850606BSG408	11	86059
850607BSG408	13	86059
850608BSG408	15	86059
850609BSG408	17	86059
850610BSG408	19	86059
850611BSG408	21	86059
850612BSG408	23	86059
850613BSG408	25	86059
850614BSG408	27	86059
850615BSG408	29	86059
850616BSG408	31	86059
850617BSG408	33	86059
850618BSG409	1	86059
850619BSG409	3	86059
850620BSG409	5	86059
850621BSG409	7	86059
850622BSG409	9	86059
850623BSG409	11	86059
850624BSG409	25	86060
850625BSG409	27	86060
850626BSG409	29	86060
850627BSG409	31	86060
850628BSG409	33	86060
850629BSG409	35	86060
850630BSG409	13	86059
850631BSG409	15	86059
850632BSG409	17	86059
850633BSG409	19	86059
850634BSG409	21	86059
850635BSG409	23	86059
0++++++++	0	0

Figure 6 Table File

```
//X7LMPHDR JOB (C0011,304,80),' JUN853 GLB ',TIME=(5,0),CLASS=F          00000010
/*JOBPARM L=200                                                         00000020
//PRINT OUTPUT LINECT=80,DEFAULT=YES                                    00000030
//PDELTA EXEC PGM=GLOBAL,REGION=1200K                                   00000040
//PDELTA.STEPLIB DD DSN=X7JMV.SEFDT.LOAD,DISP=SHR                       00000050
//GO.FT05F001 DD DISP=SHR,LABEL=(,,,IN),                                00000060
// DSN=X7LMP.LIB.CNTL(JUN853DT)                                         00000070
//GO.FT06F001 DD SYSOUT=G,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=141,         00000080
// BUFNO=1),SPACE=(CYL,(10,1))                                          00000090
//GO.FT09F001 DD UNIT=(9TRACK,,DEFER),LABEL=(1,NL),DISP=OLD,            00000100
// DCB=(RECFM=FB,LRECL=630,BLKSIZE=630,DEN=4),VOL=SER=DUMAT3            00000110
//GO.FT10F001 DD UNIT=AFF=FT09F001,LABEL=(,NL),DISP=OLD,                00000120
// DCB=(RECFM=U,BLKSIZE=13500,DEN=4),VOL=SER=MATIN3                     00000130
//GO.FT11F001 DD UNIT=(9TRACK,,DEFER),LABEL=(,NL,,OUT),                 00000140
// DCB=(RECFM=U,BLKSIZE=10000,DEN=4),                                   00000150
// VOL=SER=PDELTA                                                       00000160
//GO.FT12F001 DD DSN=X7LMP.TABLE.JUN85,DISP=SHR,                        00000170
// LABEL=(,,,IN)                                                        00000180
//GO.FT13F001 DD DSN=X7LMP.TABLE.JUN85,DISP=SHR,                        00000190
// LABEL=(,,,OUT)                                                       00000200
//GO.FT15F001 DD DSN=C0#C0.DELMAT.CAT.YEAR7,DISP=MOD                    00000210
// EXEC NOTIFYTS,USRID=X7LMP                                            00000220
```

Figure 7 Control Language

3.2.1.1 Data File (Figure 8)

The data file provides the input information for the DELMAT run. It contains only one line which consists of:

a) The VOL/SER of the DELMAT tape.

b) The sequence number of the DELMAT tape.

c) The date of the DELMAT tape (year/month).

3.2.1.2 Table File (Figure 6)

The completed table file from the PDELTA run is an input data set to the DELMAT job. Once the PDELTA runs are complete, the table file is ready for the DELMAT job.

3.2.1.3 DELMAT JCL (Figure 9)

This JCL will permit a DELMAT run on an IBM 3081 computer. It contains the following information of concern to the user:

a) Disk data sets containing DELMAT code (lines 40-130)

b) Disk data set contaig Data File (line 160).

c) Disk data set containing Table File (line 250).

3.2.2 Job Initiation

a) Only one DELMAT run is required to process an entire months data. Once the data file and JCL are complete and the PDELTA tapes are mounted, mount and initialize (1600 BPI, no-label) the DELMAT tape.

b) The DELMAT job may now be run.

3.3 Output

3.3.1 PDELTA

The PDELTA output consists of the PDELTA tapes. The format of this tape is identical to the DELMAT tape with the exceptions noted in section 2.1.3.2 . The PDELTA run also produces printed output, much of which is user specified with output options. These options are delineated below. Samples are provided of those options considered necessary for operational quality control. Those options considered diagnostic are described only.

a) Output option 1. (operational)

Subroutine PINPUT. Indicates entry to and exit from subroutine.

BSG398 51521 8506

Figure 8 Data File

```
//X7LMPMRG JOB (C0011,304,110),'   JAN86    ',TIME=(2,0),CLASS=F          00000010
/*JOBPARM L=99                                                            00000020
//A EXEC OFORTH,PARM='XREF,MAP,XL'                                        00000030
//SYSIN DD DSN=C0#C0.DELTA.MERGE.FORT(BLKDAT),DISP=SHR                    00000040
//       DD DSN=C0#C0.DELTA.MERGE.FORT(MERG),DISP=SHR                     00000050
//       DD DSN=C0#C0.DELTA.MERGE.FORT(GETINP),DISP=SHR                   00000060
//       DD DSN=C0#C0.DELTA.MERGE.FORT(MNTDEL),DISP=SHR                   00000070
//       DD DSN=C0#C0.DELTA.MERGE.FORT(NOPLAB),DISP=SHR                   00000080
//       DD DSN=C0#C0.DELTA.MERGE.FORT(TDFHMT),DISP=SHR                   00000090
//       DD DSN=C0#C0.DELTA.MERGE.FORT(GETPDR),DISP=SHR                   00000100
//       DD DSN=C0#C0.DELTA.MERGE.FORT(WRTPDR),DISP=SHR                   00000110
//       DD DSN=C0#C0.DELTA.MERGE.FORT(TDFITP),DISP=SHR                   00000120
//       DD DSN=C0#C0.DELTA.MERGE.FORT(TDFMOT),DISP=SHR                   00000130
//B EXEC OLOADERH,PROG=LINKER,REGION=430K,PARM='SIZE=420K'                00000140
//GO.FT05F001 DD DISP=SHR,LABEL=(,,,IN),                                  00000150
// DSN=X7LMP.DELMRG.DATA(JAN86)                                           00000160
//GO.FT06F001 DD SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=141,           00000170
// BUFNO=1),SPACE=(CYL,(10,1))                                            00000180
//GO.FT09F001 DD UNIT=(9TRACK,,DEFER),LABEL=(1,NL,,IN),DISP=OLD,          00000190
// DCB=(RECFM=U,LRECL=630,BLKSIZE=630,DEN=4),VOL=SER=DELIN                00000200
//GO.FT10F001 DD UNIT=(9TRACK,,DEFER),LABEL=(1,NL,,OUT),DISP=NEW,         00000210
// DCB=(RECFM=U,LRECL=630,BLKSIZE=630,DEN=3),VOL=SER=DELOUT               00000220
//GO.FT11F001 DD UNIT=AFF=FT10F001,LABEL=(,NL),DISP=NEW,                  00000230
// DCB=(RECFM=U,LRECL=31500,BLKSIZE=31500,DEN=3),VOL=SER=DELOUT           00000240
//GO.FT13F001 DD DISP=SHR,DSN=X7LMP.TABLE.JAN86                           00000250
//GO.FT41F001 DD UNIT=SYSDA,SPACE=(TRK,(5,5)),                            00000260
// DCB=(RECFM=FB,LRECL=630,BLKSIZE=6300)                                  00000270
//C EXEC NOTIFYTS,USRID=X7LMP                                             00000280
```

Figure 9 DELMAT JCL (Permitting DELMAT to run on the IBM 3081 Computer.)

b) Output option 2. (operational)

Subroutine MNTMAT. Indicates entry to and exit from subroutine.

c) Output option 3. (diagnostic)

Subroutine FILTER. Indicates entry to and exit from subroutine.

d) Output option 4. (diagnostic)

Subroutine NOPLAB. Indicates entry to and exit from subroutine.

e) Output option 5. (diagnostic)

Subroutine GETMLR. Indicates entry to and exit from subroutine.

f) Output option 6. (operational)

Subroutine POTPUT. Indicates entry to and exit from subroutine.

g) Output option 7. (diagnostic)

Subroutine WRTDAT. Indicates entry to and exit from subroutine.

h.) Output option 8 through 10.

Not currently used.

i) Output option 11. (operational)

Subroutine FINDER. Indicates entry to and exit from subroutine.

j) Output option 12. (operational)

Subroutine FITTER. Indicates entry to and exit from subroutine.

k) Output option 13. (operational)

Subroutine ZONAL. Indicates entry to and exit from subroutine.

l) Output option 14. (diagnostic)

Subroutine SORT. Indicates entry to and exit from subroutine.

m) Output option 15. (diagnostic)

Subroutine CHKISW. Indicates entry to and exit from subroutine.

n) Output option 16. (diagnostic)

Subroutine STATUS. Indicates entry to and exit from subroutine.

o) Output option 17. (operational)

Subroutine PERSIS. Indicates entry to and exit from subroutine.

p) Output option 18. (diagnostic)

Subroutine IRRAD. Indicates entry to and exit from subroutine.

q) Output option 19. (diagnostic)

Subroutine ANGLE. Indicates entry to and exit from subroutine.

r) Output option 20. (diagnostic)

Subroutine NORMAL. Indicates entry to and exit from subroutine.

s) Output option 21. (operational)

Subroutine GAPFIX. Indicates entry to and exit from subroutine.

t) Output option 22.

Not currently used.

u.) Output option 23. (operational)

Subroutine GAPLOC. Indicates entry to and exit from subroutine.

v) Output option 24. (operational)

Subroutine GAPFIL. Indicates entry to and exit from subroutine.

w) Output option 25. (diagnostic)

Subroutine DATCHK. Indicates entry to and exit from subroutine.

x) Output option 26. (diagnostic)

Subroutine SOLEPH. Indicates entry to and exit from subroutine.

y) Output option 27 through 29.

not currently used.

z) Output option 30. (diagnostic)

Subroutine EPHEM. Indicates entry to and exit from subroutine.

aa) Output option 31. (diagnostic)

Subroutine EPHEM. Provides spacecraft ephemeris data for temporary observations in large data gaps.

bb) Output option 32. (diagnostic)

Subroutine RESPON. Provides shortwave heating response parameters from terrestrial forcing.

cc) Output option 33. (diagnostic)

Subroutine RESPON. Provides shortwave heating response parameters from solar forcing.

dd) Output option 34. (diagnostic)

Subroutine RESPON. Provides irradiances, corrections and location parameters for each observation after application of longwave and shortwave heating corrections.

ee) Output option 35. (diagnostic)

Subroutine SUNDIS. Indicates entry to and exit from subroutine as well as the time and earth-sun distance calculated.

ff) output option 36. (operational)

Subroutine LWQC. Indicates entry to and exit from subroutine.

gg) Output option 37. (operational)

Subroutine LWQC. Provides longwave heating parameters during quality control check triggered by channel 12 zonal average substitution. Will appear only if a longwave heating correction is plus or minus 3 standard deviations from a given mean value for that solar zenith angle.

hh) Output option 38 through 40.

Not currently used.

ii) Output option 41. (operational).

Subroutine SETUP. Indicates entry to and exit from subroutine.

jj) Output option 42. (operational)

Subroutine RESPON. Indicates entry to and exit from subroutine.

kk) Output option 43. (diagnostic)

Subroutine RESPON. Indicates status of longwave time series determination relative to clipping of the sunblip.

ll) Output option 44. (operational)

Subroutine SUNBLP. Indicates entry to and exit from subroutine.

mm) Output option 45. (diagnostic)

Subroutine SUNBLP. Indicates entry into various "do loops" within the subroutne.

nn) Output option 46. (operational)

Subroutine FILLER. Indicates entry to and exit from subroutine.

oo) Output option 47. (diagnostic)

Subroutine FILLER. Provides information concerning the start and stop points for large data gaps.

pp) Output option 48. (diagnostic)

Subroutine SZANG. Indicates entry to and exit from subroutine.

qq) Output option 49. (diagnostic)

Subroutine SZANG. Provides solar ephemeris data during the filling of large data gaps with solar zenith angles.

rr) Output option 50.

Not currently used.

ss) Output option 51. (diagnostic)

Subroutine FITTER. Provides irradiances and midnight offset corrections for each observation as these corrections are calculated.

tt) Output option 52. (operational)

Subroutine ZONAL. Provides channel 12, 13, and 14 mean zonal irradiances for an entire MAT day for 720 along track angle bins. (See figure 14 & 15).

uu) Output option 53. (diagnostic)

Subroutine ANGLE. Provides along track angle information for each observation as it is calculated.

vv) Output option 54. (diagnostic)

Subroutine SUNBLP. Provides status information for indices used in interpolation across sunblips.

ww) Output option 55. (operational)

Subroutine SUNBLP. Provides knots of sunblip interpolations. (See figure 16).

xx) Output option 56.

Not currently used.

yy) Output option 57. (operational)

Subroutine PERSIS. Indicates number of along-track angle bin values for channel 12 replaced by persistance. Will not appear if persistance is not needed.

zz) Output option 58. (operational)

Subroutine PERSIS. Indicates number of along-track angle bin values for channels 13 and 14 replaced by persistence. Will not appear if persistence is not needed.

aaa) Output option 59.

Not currently used.

bbb) Output option 60. (operational)

Subroutine LWAVG. Indicates entry to or exit from subroutine. It also provides the Julian day and the anchor Julian days of the climatological period selected.

ccc) Output option 61. (operational)

Subroutine LWAVG. Provides means, standard deviations and resultant limits for 30^{o} solar zenith angle bin climatological midnight offsets. (see figure 16).

ddd) Output options 62 through 70

Not currently used.

The following output is printed for every PDELTA run and is not a user option.

a. Output header information (see Figure 10).

b. Data file echo print (see Figure 10).

c. Expanded description of data file options, including a list of MAT's specified, default midnight offsets, channel 13 and 14 sensitivities and the output options desired. (See Figure 10)

d. Echo print of the Table File, prior to this MAT day's processing. (See Figure 11).

e. Number of files on PDELTA tape prior to this MAT day's processing (see Figure 11).

f. MAT TDF for this day. (See Figures 11 and 12)

g. Statement indicating whether MAT was mounted successfully. (See Figure 12).

h. Julian day, Greenwich Hour Angle and time of this MAT day's first observation (see Figure 12).

i. Summary of orbits processed on this MAT day. (See Figure 12).

j. Indicator of Julian Day change (this day's MAT observations extend across midnight GMT). (See Figure 12).

k. Summary of MAT data quality by observation: (see Figure 12)

GOOD DATA	- Data with a "zero" status word
DQLI	- Data quality loss interval.
GO/NO GO	- Data contaminated by GO/NO GO Heater use.
ECAL	- Data contaminated by electronic calibration system being in use.
CH 12 Narrow	- Channel 12 is in narrow field of view mode
CH 12 Shuttered	Channel 12 is shuttered.
Out of Limits	- Data exceeding a maximum or minimum irradiance value for channel 12, 13, or 14.
Out of Range	- The difference between the maximum and minimum irradiance in a major frame for any channel exceeds a certain value.
GO/NO GO Delay	- Major frames of data following a GO/NO GO heater on episode.

```
**********************************************
*  N I M B U S - 7    E R B    D E L T A     *
*                                            *
*              DELMAT    - DAILY RUN         *
*  VERSION  3.1 LAST MODIFIED ON 03.16.85     *
*              VERSION NAME VER85075          *
*               ALGORITHM ID    4            *
*          CALIBRATION SET NUMBER    1       *
*    RUN DATE 21.59.28.10 FRI FEB 28,1986     *
**********************************************
```

INPUT CARD IMAGES

```
          1         2         3         4         5         6         7         8
 12345678901234567890123456789012345678901234567890123456789012345678901234567890
 ********************************************************************************
1*PDELTA    BSG409          8506                                                 *  1
2*MAT       JRW296        850633     51841-  1  1                                *  2
3*MAT       JRW296        850634     51841-  2  0                                *  3
4*MAT       JRW296        850635     51841-  3  0                                *  4
5*MIDN      999                                                                  *  5
6*SENS      00205000110000000000000230                                           *  6
7*CH11      10072-0186251007700000611                                            *  7
8*OUTPUT    11010100001110001000101100000000001110001101010000010010110110000000000*  8
 ********************************************************************************
 12345678901234567890123456789012345678901234567890123456789012345678901234567890
          1         2         3         4         5         6         7         8
```

```
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
: DATA WILL BE OUTPUT TO PRELIMINARY DELTA BSG409  FOR 8506 :
''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
```

INPUT MAT TAPES

	VOLSER	YYMMDD	SEQNO
1	JRW296	850633	51841
2	JRW296	850634	51841
3	JRW296	850635	51841

```
 MIDN DEFAULTMIDN       999      0      0      0      0      0      0      0      0      0      0      0      0      0
 SENSITIVITIES,  SCH13   0.0020500  SCH14   0.0011000
 SENSITIVITIES,  ECH13   0.0        ECH14   0.0
 SUNRISE SUNBLIP SHM FACTOR    2.300
 DAY SLOPES-OFFSETS     1.00720     -0.01860      2.50
 NIGHT SLOPES-OFFSETS   1.00770      0.0          0.60
 TOTAL CHANNEL USED  11
```

PRINT FLAG OPTIONS SELECTED

1	21	44
2	23	46
4	24	52
6	35	55
11	36	57
12	37	
13	41	
17	42	

Figure 10 Output Header Information and Data File Echo Print

PRELIMINARY DELTA TABLE

DAY OF MONTH	MAT TAPE DATE	DELTA VOLUME/SERIAL NUMBER	DELTA DATA FILE NUMBER	CREATION DATE
1	811001	BSG390	1	83265
2	0	********	0	0
3	811003	BSG390	25	83265
4	811004	BSG390	3	83265
5	811005	BSG390	5	83265
6	0	********	0	0
7	811007	BSG390	7	83265
8	811008	BSG390	9	83265
9	811009	BSG390	11	83265
10	0	********	0	0
11	811011	BSG390	13	83265
12	811012	BSG390	15	83265
13	811013	BSG390	17	83265
14	0	********	0	0
15	811015	BSG390	19	83265
16	811016	BSG390	21	83265
17	811017	BSG390	23	83265
18	0	********	0	0
19	811019	BSG391	1	83265
20	811020	BSG391	3	83265
21	811021	BSG391	5	83265
22	0	********	0	0
23	811023	BSG391	7	83265
24	811024	BSG391	9	83265
25	811025	BSG391	11	83265
26	0	********	0	0
27	811027	BSG391	13	83265
28	811028	BSG391	15	83265
29	811029	BSG391	17	83265
30	0	********	0	0
31	811031	BSG391	19	83265
32	811032	BSG391	21	83265
33	811033	BSG391	23	83265
34	0	********	0	0
35	811035	BSG391	25	83265
36	811036	BSG391	27	83265

26 DATA FILES WERE FOUND ON THIS DELTA TAPE

SETUP EXITED
PINPUT ENTERED
MNTMAT ENTERED

**********BEGIN PROCESSING FOR MAT TAPE JHW320 SEQUENCE NUMBER 12721 DATE 811001**********
*NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC12721-3 ERB LPD TO I9 START 1981 272 011252 TO 1981 275 002332 GEN 1983 025 213129
*NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC12721-2 ERB SACC TO LPD START 1981 272 011252 TO 1981 275 002332 GEN 1983 006 015829

INCEST 11 09 17 82 CAL SET NO 4 CS 14 79

TDF RECORD FROM INPUT MAT TAPE:
*NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC12721-3 ERB LPD TO I9 START 1981 272 011252 TO 1981 275 002332 GEN 1983 025 213129
*NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC12721-1 ERB SACC TO LPD START 1981 272 011252 TO 1981 275 1206 GEN 1983 006 015829

INCEST 11 09 17 82 CAL SET NO 4 CS 14 79

TDF RECORD FROM INPUT MAT TAPE:
*NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC12721-3 ERB LPD TO I9 START 1981 272 011252 TO 1981 275 002332 GEN 1983 025 213129
*NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC12721-1 ERB SACC TO LPD START 1981 272 011252 TO 1981 275 1230 GEN 1983 006 015829

INCEST 11 09 17 82 CAL SET NO 4 CS 14 79

TDF RECORD FROM INPUT MAT TAPE:
*NIMBUS-7 NOPS SPEC NO T113011 SQ NO LA12701-1 ERB NOC TC SACC START 1981 270 003428 TO 1981 277 065548 GEN 1982 345 084732

UFCMERGE VERSION 3.1

TDF RECORD FROM INPUT MAT TAPE:
*NIMBUS-7 NOPS SPEC NO T113011 SQ NO LA00603-1 ERB NOC TC SACC START 1981 274 235444 GEN 1982 325 235145

Figure 11. Echo Print of Table File and TDF

```
TDF RECORD FROM INPUT MAT TAPE:
 NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA00531-1 ERB  NOC  TO SACC START 1981 270 003428                    GEN 1981 273 134004

TDF RECORD FROM INPUT MAT TAPE:
 NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA00532-1 ERB  NOC  TO SACC START 1981 272 011252                    GEN 1981 273 244504

TDF RECORD FROM INPUT MAT TAPE:
 NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA00544-1 ERB  NOC  TO SACC START 1981 272 220300                    GEN 1981 278 320923

TDF RECORD FROM INPUT MAT TAPE:
 NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA00579-1 ERB  NOC  TO SACC START 1981 276 002820                    GEN 1981 323 200109

TDF RECORD FROM INPUT MAT TAPE:
 NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA00549-1 ERB  NOC  TO SACC START 1981 276 022732                    GEN 1981 279 314619

TDF RECORD FROM INPUT MAT TAPE:
 NIMBUS-7 NOPS SPEC NO T123044 SQ NO LA 1531-1 ERB  MOHS TO SACC START 1981 270 003430 TO 1981 277 1CC3C GEN 1981 355 134127
          VERSION  C VERSION  A

MNTMAT: MAT TAPE JR4329   HAS BEEN SUCCESSFULLY MOUNTED

  ***MNTMAT EXITED***
  JDYOLD=  274 GMAOLD= 1174 TIMEC=    503
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14826
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14827
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14828
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14829
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14830
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14831
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14832
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14833
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14834
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14835
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14836
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14837
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14838
  ***JULIAN DAY CHANGE***          OLD= 274          NEW= 275
  ***PINPUT***ORBITAL SUMMARY PROCESSED, ORBIT NUMBER 14839
  ***PINPUT***DAILY SUMMARY PROCESSED
  GOOD DATA              15748
  COLI                       8
  GO/NO GO ON               56
  ECAL                      12
  CH12 SHUTTERED            20
  CH12 NARROW                4
  OUT OF LIMITS              0
  OUT OF RANGE              20

  GO/NO GO DELAY             0
  TOTAL OBS.             15868
```

Figure 12 Orbital Summary and Data Status.

l. Summary of missing observations found in MAT by time (in seconds) from start of the day. (See Figure 13).

m. Start and end points (by this day's observation number) of data gaps. (See Figure 13).

n. Start and end points (by this day's observation number) of good data. (See Figure 13).

o. Number of gaps for channel 12 (above) and 13, 14 (below). For each gap "T" implies gap will be filled by interpolation, "F" that it will be filled by zonally averaged data. (See Figure 14).

p. Summary of midnight points found and resultant midnight offset corrections. First listed time is GMT seconds of the day for the point 21 major frames prior to the midnight point (the second listed GMT time). (See Figure 14).

q. The satellite inclination for the day. (See Figure 14)

r. Results of the filling process for the missing data itemized in l) above. (See Figure 15).

s. Parameters describing the knots for interpolation and sunblip clipping. (Figure 16).

t. Longwave heating correction means and standard deviations used for quality control for this run (Figure 16).

u. Global averages of DELMAT parameters used for computing global CAT (Figure 17).

v. DELMAT daily solar zenith angle band averages. (Figure 18).

w. The first observation of each MAT major frame plus filled data gaps for the entire day. The format is listed below: (read data left to right. (See Figure 19).

   i. Time in seconds since 0000 GMT of the MAT day being processed.

   ii. Satellite declination in degrees (x100).

   iii. Satellite right ascension in degrees (x100).

   iv. Solar zenith angle in degrees (x100).

   v. Instrument status word (see Appendix A).

   vi. Channel 12 corrected irradiance in W/m^2 (x10).

   vii. Channel 13 corrected irradiance in W/m^2 (x10).

   viii. Channel 14 corrected irradiance in W/m^2 (x10).

   ix. Channel 13 midnight offset correction in W/m^2 (x10).

   x. Channel 14 midnight offset correction in W/m^2 (x10).

```
***CAP FIX ENTERED***
240 OBS ***FIX ADDED TO BEGINNING AND END OF ARRAYS
***GAPLOC ENTERED***
    32  OBSERVATIONS ARE MISSING BETWEEN      3989  AND      4121
     4  OBSERVATIONS ARE MISSING BETWEEN      8149  AND      8169
     4  OBSERVATIONS ARE MISSING BETWEEN      8213  AND      8233
    48  OBSERVATIONS ARE MISSING BETWEEN      8465  AND      8681
     4  OBSERVATIONS ARE MISSING BETWEEN     16453  AND     16473
    12  OBSERVATIONS ARE MISSING BETWEEN     24981  AND     25033
     4  OBSERVATIONS ARE MISSING BETWEEN     30901  AND     30921
     4  OBSERVATIONS ARE MISSING BETWEEN     31301  AND     31321
     4  OBSERVATIONS ARE MISSING BETWEEN     32421  AND     32441
     4  OBSERVATIONS ARE MISSING BETWEEN     44149  AND     44169
     4  OBSERVATIONS ARE MISSING BETWEEN     44949  AND     44969
     4  OBSERVATIONS ARE MISSING BETWEEN     45205  AND     45225
     4  OBSERVATIONS ARE MISSING BETWEEN     45557  AND     45577
     4  OBSERVATIONS ARE MISSING BETWEEN     46101  AND     46121
     4  OBSERVATIONS ARE MISSING BETWEEN     46645  AND     46665
     4  OBSERVATIONS ARE MISSING BETWEEN     47573  AND     47593
  1660  OBSERVATIONS ARE MISSING BETWEEN     79269  AND     85913

NUMBER OF DATA VOIDS FOR CHAN 12 IS 27

        START        END
            1        240
         1113       1144
         1653       1656
         2169       2172
         2217       2284
         2801       2804
         2993       2996
         4229       4232
         6361       6373
         6349       6392
         7841       7844
         7941       7984
         8133       8136
         8221       8224
        11153      11156
        11353      11356
        11417      11420
        11505      11508
        11641      11644
        11777      11780
        11785      11792
        11893      11896
        11985      11988
        12009      12012
        12553      12956
        19533      21592
        21829      22152

NUMBER OF DATA VOIDS FOR CHAN 13 IS 27

        START        END
            1        240
         1113       1144
         1653       1656
         2169       2172
         2217       2284
         2801       2804
         2993       2996
         4229       4232
         6361       6373
         6349       6392
         7841       7844
         7941       7984
         8133       8136
         8221       8224
        11153      11156
        11353      11356
        11417      11420
        11505      11508
        11641      11644
        11777      11780
        11785      11792
        11893      11896
        11985      11988
        12009      12012
        12553      12956
        19533      21592
        21853      22152

START AND STOP LOCATIONS OF GOOD DATA

              CHAN12                          CHAN13
        START        END            START        END
            1       1112                1       1112
         1145       1652             1145       1652
         1657       2168             1657       2168
         2173       2236             2173       2236
         2285       2800             2285       2800
         2805       2992             2805       2992
         2997       4228             2997       4228
         4233       6360             4233       6360
         6373       6388             6373       6388
         6393       7840             6393       7840
         7845       7940             7845       7940
         7945       8132             7945       8132
         8137       8220             8137       8220
         8225      11152             8225      11152
        11157      11352            11157      11352
        11357      11416            11357      11416
        11421      11504            11421      11504
        11509      11640            11509      11640
        11645      11776            11645      11776
        11781      11784            11781      11784
        11793      11892            11793      11892
        11897      11984            11897      11984
        11989      12008            11989      12008
        12013      12952            12013      12952
        12957      19932            12957      19932
        21593      21824            21593      21852
***GAPLOC EXITED***
***CAP FIX ENTERED***
```


Figure 13 Data Cap Information.

```
# OF GAPS=  27
FTTTFTFTTTTTFTFTTTTTTTFFF
# OF GAPS=  27
FTTTFTFTTTTTFTFTTTTTTTFFF
 ***GAPFIL EXITED***
 ***GAPFIX EXITED***
   ***** SUBROUTINE FINDER ENTERED *****
GMT LW   6085 CH12   1513 ISW     C GMT MN  6425 CH13.14    -44     21    ISW    0
GMT LW  12341 CH12   1548 ISW     C GMT MN 12677 CH13.14    -44     24    ISW    0
GMT LW  18592 CH12   1610 ISW     C GMT MN 18929 CH13.14    -59     24    ISW    0
GMT LW  24841 CH12   1733 ISW     C GMT MN 25177 CH13.14    -54     25    ISW    0
GMT LW  31093 CH12   1848 ISW     C GMT MN 31429 CH13.14    -46     26    ISW    0
GMT LW  37345 CH12   1895 ISW     C GMT MN 37681 CH13.14    -44     27    ISW    0
GMT LW  43593 CH12   1850 ISW     C GMT MN 43929 CH13.14    -41     27    ISW    0
GMT LW  49845 CH12   1778 ISW     C GMT MN 50181 CH13.14    -49     26    ISW    0
GMT LW  56097 CH12   1845 ISW     C GMT MN 56433 CH13.14    -44     26    ISW    0
GMT LW  62345 CH12   1808 ISW     C GMT MN 62681 CH13.14    -52     26    ISW    0
GMT LW  68597 CH12   1905 ISW     C GMT MN 68933 CH13.14    -44     26    ISW    0
GMT LW  74848 CH12   2046 ISW     C GMT MN 75185 CH13.14    -28     28    ISW    0
        THE MIDNITE OFFSETS FOR CHANNEL 13 AND 14 FOR THE DAY ARE
    GMT        LAT        JN        CH13 OFFSET     CH14 OFFSET
   6425.       3.02       7.91        12.09           -2.10
  12677.       2.98       7.97        12.15           -2.10
  18929.       2.95       8.04        12.24           -2.20
  25177.       3.14       8.14        12.33           -2.30
  31429.       3.10       8.21        12.15           -2.60
  37681.       3.04       8.27        11.68           -2.70
  43929.       3.24       8.38        11.50           -2.70
  50181.       3.20       8.44        12.00           -2.60
  56433.       3.16       8.50        11.70           -2.30
  62681.       3.24       8.60        11.63           -2.60
  68933.       3.31       8.67        12.02           -2.00
  75185.       3.27       8.74        11.14           -2.80
   ***** SUBROUTINE FINDER EXITED *****
   ***** SUBROUTINE FITTER ENTERED *****
   ***** SUBROUTINE FITTER EXITED *****
   ***** SUBROUTINE MAXINC ENTERED *****

   THE SATELLITE INCLINATION FOR THE DAY IS    99.29 DEGREES

   ***** SUBROUTINE MAXINC EXITED *****
```

CHANNEL 12-14 ALONG TRACK ANGLE BIN MEANS

BIN #	ATA(DEG)	#SAMP CH12	MEAN	#SAMP CH13.14	MEANS	
1	0.0	12	184.45	12	7.15	0.10
2	0.5	12	184.66	12	7.13	0.17
3	1.0	12	185.18	12	7.11	-0.10
4	1.5	12	185.53	12	7.09	0.14
5	2.0	12	185.72	12	7.05	0.13
6	2.5	12	185.85	12	7.04	0.20
7	3.0	12	186.15	12	7.03	0.42
8	3.5	12	186.35	12	7.03	0.07
9	4.0	12	186.52	12	7.01	-0.17
10	4.5	12	186.56	12	6.93	-0.10
11	5.0	12	186.71	12	6.96	-0.04
12	5.5	12	186.83	12	6.93	0.03
13	6.0	12	187.05	12	6.91	0.02
14	6.5	12	187.25	12	6.95	-0.25
15	7.0	12	187.38	12	6.85	-0.10
16	7.5	12	187.49	12	6.95	-0.02
17	8.0	12	187.69	12	6.89	-0.04
18	8.5	12	187.93	12	6.83	-0.08
19	9.0	12	188.10	12	6.83	-0.09
20	9.5	12	188.23	12	6.84	-0.10
21	10.0	12	188.38	12	6.81	-0.10
22	10.5	12	188.57	12	6.80	-0.13
23	11.0	12	188.78	12	6.79	-0.15
24	11.5	12	189.01	12	6.77	-0.16
25	12.0	12	189.23	12	6.78	-0.17
26	12.5	12	189.36	12	6.75	-0.18
27	13.0	12	189.50	12	6.74	-0.18
28	13.5	12	189.53	12	6.77	-0.21
29	14.0	12	189.72	12	6.75	-0.21
30	14.5	12	189.80	12	6.75	-0.22
31	15.0	12	189.82	12	6.71	-0.11
32	15.5	12	189.79	12	6.69	-0.48
33	16.0	13	189.22	13	6.73	-0.34
34	16.5	13	189.12	13	6.75	-0.43
35	17.0	13	189.02	13	6.75	-0.28
36	17.5	13	188.92	13	6.75	-0.29
37	18.0	13	188.80	13	6.75	-0.28
38	18.5	13	188.52	13	6.74	-0.52
39	19.0	13	188.25	13	6.72	-0.55
40	19.5	13	188.00	13	6.69	-0.30
41	20.0	13	187.75	13	6.68	-0.31
42	20.5	13	187.50	13	6.68	-0.31
43	21.0	13	187.20	13	6.69	-0.32
44	21.5	13	186.85	13	6.69	-0.33
45	22.0	13	186.42	13	6.68	-0.33
46	22.5	13	186.05	13	6.67	-0.32
47	23.0	13	185.62	13	6.70	-0.66
48	23.5	13	185.30	13	6.70	-0.64
49	24.0	13	184.87	13	6.67	-0.65
50	24.5	13	184.46	13	6.63	-0.66

Figure 14 **Midnight** Offset Calculation and ATA Bin Irradiances.

```
 701    350.0      12       175.15      12       7.71       0.42
 702    350.5      12       175.13      12       7.73       0.36
 703    351.0      12       175.23      12       7.70       0.31
 704    351.5      12       175.45      12       7.64       0.27
 705    352.0      12       175.77      12       7.60       0.25
 706    352.5      12       176.17      12       7.58       0.22
 707    353.0      12       176.65      12       7.55       0.19
 708    353.5      12       177.12      12       7.51       0.25
 709    354.0      12       177.61      12       7.49       0.39
 710    354.5      12       178.21      12       7.42       0.17
 711    355.0      12       178.86      12       7.39       0.30
 712    355.5      12       179.56      12       7.38       0.36
 713    356.0      12       180.18      12       7.38       0.19
 714    356.5      12       180.79      12       7.38       0.25
 715    357.0      12       181.23      12       7.32       0.31
 716    357.5      12       181.85      12       7.28       0.30
 717    358.0      12       182.42      12       7.25       0.30
 718    358.5      12       183.03      12       7.24       0.29
 719    359.0      12       183.58      12       7.20       0.26
 720    359.5      12       183.94      12       7.19       0.21
  ***** SUBROUTINE ZONAL EXITED *****

    ***** SUBROUTINE PERSIS ENTERED *****

    ***** SUBROUTINE PERSIS EXITED *****

*** FILLER ENTERED ***

    240 OBSERVATIONS BETWEEN OBSERVATION NUMBER      1 AND   240 HAVE BEEN FILLED FOR CHANNEL  13
     48 OBSERVATIONS BETWEEN OBSERVATION NUMBER   2237 AND  2284 HAVE BEEN FILLED FOR CHANNEL  13
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER   2993 AND  2996 HAVE BEEN FILLED FOR CHANNEL  13
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER   8221 AND  8224 HAVE BEEN FILLED FOR CHANNEL  13
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER  11353 AND 11356 HAVE BEEN FILLED FOR CHANNEL  13
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER  12953 AND 12956 HAVE BEEN FILLED FOR CHANNEL  13
   1660 OBSERVATIONS BETWEEN OBSERVATION NUMBER  19933 AND 21592 HAVE BEEN FILLED FOR CHANNEL  13
    300 OBSERVATIONS BETWEEN OBSERVATION NUMBER  21853 AND 22152 HAVE BEEN FILLED FOR CHANNEL  13
    240 OBSERVATIONS BETWEEN OBSERVATION NUMBER      1 AND   240 HAVE BEEN FILLED FOR CHANNEL  12
     48 OBSERVATIONS BETWEEN OBSERVATION NUMBER   2237 AND  2284 HAVE BEEN FILLED FOR CHANNEL  12
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER   2993 AND  2996 HAVE BEEN FILLED FOR CHANNEL  12
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER   8221 AND  8224 HAVE BEEN FILLED FOR CHANNEL  12
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER  11353 AND 11356 HAVE BEEN FILLED FOR CHANNEL  12
      4 OBSERVATIONS BETWEEN OBSERVATION NUMBER  12953 AND 12956 HAVE BEEN FILLED FOR CHANNEL  12
   1660 OBSERVATIONS BETWEEN OBSERVATION NUMBER  19933 AND 21592 HAVE BEEN FILLED FOR CHANNEL  12
    324 OBSERVATIONS BETWEEN OBSERVATION NUMBER  21829 AND 22152 HAVE BEEN FILLED FOR CHANNEL  12
*** FILLER EXITED ***
```

Figure 15 Missing Data Fill-in

```
*** RESRCH VERSION 11 ENTERED ***
*** SUNBLP ENTERED ***
SUNBLP: INTERPOLATION <NO TS -     1   395 0.10910E 04 0.14420E 03
SUNBLP: INTERPOLATION <NO TS -     2   394 0.10970E 04 0.14410E 03
SUNBLP: INTERPOLATION <NO TS -     3   393 0.11130E 04 0.14350E 03
SUNBLP: INTERPOLATION <NO TS -     4   397 0.11290E 04 0.14290E 03
SUNBLP: INTERPOLATION <NO TS -     5   572 0.18250E 04 0.13710E 03
SUNBLP: INTERPOLATION <NO TS -     6   576 0.18450E 04 0.10840E 03
SUNBLP: INTERPOLATION <NO TS -     7   580 0.18610E 04 0.11000E 03
SUNBLP: INTERPOLATION <NO TS -     8   584 0.18770E 04 0.11150E 03
*** SUNBLP EXITED ***
*** SUNBLP ENTERED ***
SUNBLP: INTERPOLATION <NO TS -     1  1296 0.47250E 04 0.14130E 03
SUNBLP: INTERPOLATION <NO TS -     2  1300 0.47410E 04 0.14020E 03
SUNBLP: INTERPOLATION <NO TS -     3  1304 0.47570E 04 0.13930E 03
SUNBLP: INTERPOLATION <NO TS -     4  1308 0.47730E 04 0.13830E 03
SUNBLP: INTERPOLATION <NO TS -     5  1443 0.54730E 04 0.15060E 03
SUNBLP: INTERPOLATION <NO TS -     6  1447 0.54890E 04 0.15710E 03
SUNBLP: INTERPOLATION <NO TS -     7  1451 0.55050E 04 0.15610E 03
SUNBLP: INTERPOLATION <NO TS -     8  1455 0.55210E 04 0.15510E 03
*** SUNBLP EXITED ***
*** SUNBLP ENTERED ***
SUNBLP: INTERPOLATION <NO TS -     1  1948 0.73330E 04 0.14520E 03
SUNBLP: INTERPOLATION <NO TS -     2  1952 0.73490E 04 0.14350E 03
SUNBLP: INTERPOLATION <NO TS -     3  1956 0.73650E 04 0.14150E 03
SUNBLP: INTERPOLATION <NO TS -     4  1960 0.73810E 04 0.13950E 03
SUNBLP: INTERPOLATION <NO TS -     5  2114 0.80770E 04 0.13800E 03
SUNBLP: INTERPOLATION <NO TS -     6  2134 0.80930E 04 0.13990E 03
SUNBLP: INTERPOLATION <NO TS -     7  2142 0.81050E 04 0.11030E 03
SUNBLP: INTERPOLATION <NO TS -     8  2146 0.81250E 04 0.11200E 03
*** SUNBLP EXITED ***
*** SUNBLP ENTERED ***
SUNBLP: INTERPOLATION <NO TS -     1  2860 0.10937E 05 0.13490E 03
SUNBLP: INTERPOLATION <NO TS -     2  2863 0.10993E 05 0.13830E 03
SUNBLP: INTERPOLATION <NO TS -     3  2867 0.11050E 05 0.13730E 03
SUNBLP: INTERPOLATION <NO TS -     4  2871 0.11025E 05 0.13990E 03
SUNBLP: INTERPOLATION <NO TS -     5  3046 0.11725E 05 0.15930E 03
SUNBLP: INTERPOLATION <NO TS -     6  3050 0.11741E 05 0.15930E 03
SUNBLP: INTERPOLATION <NO TS -     7  3054 0.11757E 05 0.15930E 03
SUNBLP: INTERPOLATION <NO TS -     8  3058 0.11773E 05 0.15930E 03
*** SUNBLP EXITED ***
*** SUNBLP ENTERED ***
SUNBLP: INTERPOLATION <NO TS -     1  3510 0.13581E 05 0.14550E 03
SUNBLP: INTERPOLATION <NO TS -     2  3514 0.13597E 05 0.14580E 03
SUNBLP: INTERPOLATION <NO TS -     3  3518 0.13613E 05 0.14550E 03
SUNBLP: INTERPOLATION <NO TS -     4  3522 0.13629E 05 0.14530E 03
SUNBLP: INTERPOLATION <NO TS -     5  3697 0.14329E 05 0.10530E 03
SUNBLP: INTERPOLATION <NO TS -     6  3701 0.14345E 05 0.10690E 03
SUNBLP: INTERPOLATION <NO TS -     7  3705 0.14361E 05 0.10900E 03
SUNBLP: INTERPOLATION <NO TS -     8  3709 0.14377E 05 0.10930E 03
*** SUNBLP EXITED ***
*** SUNBLP ENTERED ***
SUNBLP: INTERPOLATION <NO TS -     1  4422 0.17229E 05 0.13790E 03
SUNBLP: INTERPOLATION <NO TS -     2  4426 0.17245E 05 0.13570E 03
SUNBLP: INTERPOLATION <NO TS -     3  4430 0.17261E 05 0.13580E 03
SUNBLP: INTERPOLATION <NO TS -     4  4434 0.17277E 05 0.13490E 03
SUNBLP: INTERPOLATION <NO TS -     5  4608 0.17936E 05 0.14420E 03
SUNBLP: INTERPOLATION <NO TS -     6  4612 0.17986E 05 0.13430E 03
SUNBLP: INTERPOLATION <NO TS -     7  4616 0.18005E 05 0.14420E 03
SUNBLP: INTERPOLATION <NO TS -     8  4620 0.18021E 05 0.14510E 03
*** SUNBLP EXITED ***
*** RESRCH EXITED ***

    ***LWQC ENTERED***
***LWQC ENTERED*** 27*
  1  -7.4   0.6   -5.6   -9.2   -7.5   -7.2   0.6   0.6   0.5   0.5
  2  -6.9   0.7   -4.7   -9.1   -6.5   -7.4   0.6   0.9   0.5   0.5
  3  -5.7   0.7   -3.6   -7.8   -4.7   -6.5   0.7   0.7   0.5   0.5
  4  -4.3   0.5   -2.8   -5.9   -3.4   -5.5   0.6   0.4   0.5   0.5
  5  -6.2   0.5   -4.6   -7.7   -6.1   -6.0   0.6   0.4   0.5   0.5
  6  -7.7   0.6   -6.0   -9.3   -8.3   -6.9   0.6   0.5   0.5   0.5
  7  -8.0   0.5   -6.4   -9.6   -8.0   -8.0   0.5   0.6   0.5   0.5
  8  -7.9   0.7   -5.9   -10.0  -8.1   -7.7   0.5   0.9   0.5   0.5
  9  -6.9   0.5   -5.5   -8.4   -7.0   -6.9   0.3   0.7   0.5   0.5
 10  -5.9   0.3   -4.5   -6.9   -6.4   -5.2   0.2   0.5   0.5   0.5
 11  -6.0   0.4   -4.9   -7.1   -8.5   -5.0   0.5   0.2   0.5   0.5
 12  -6.7   0.6   -4.5   -8.5   -7.2   -6.0   0.6   0.6   0.5   0.5
***LWQC EXITED*** 27* 12*
```

Figure 16 Sun Blip Interpolation and LW Heating QC.

GLOBAL AVERAGES OF DELMAT PARAMETERS FOR CALIBRATION OFFSET COMPUTATION

DELMAT PARAMETER	A - N	D - N
CHANNEL 12	378.64	169.61
CHANNEL 13	187.64	6.10
CHANNEL 14	87.79	3.28
CH 13 MID OFF	15.23	15.27
CH 14 MID OFF	-0.42	-0.42
CH 13 SW HEAT	-0.14	-2.97
CH 14 SW HEAT	-0.22	-2.61
CH 13 LW HEAT	-7.86	-6.32
CH 12 CLIP	-0.35	-1.28
CH 13 CLIP	-0.27	-2.75
CH 14 CLIP	-0.24	-2.36

Figure 17 DELMAT Parameter Global Averages.

*** ZAVG ENTERED ***

BIN	SZA	NUM	LAT	CH12		CH13		CH14		13MO		14MO	
1	2.5	225	-21.0	417.2	50.7	204.4	56.0	95.6	32.3	15.3	0.7	-0.4	0.4
2	6.8	236	-16.7	411.0	45.5	201.5	52.9	93.3	30.5	15.2	0.8	-0.4	0.4
3	11.3	234	-12.2	407.3	42.6	202.4	53.8	93.0	30.2	15.2	0.7	-0.4	0.4
4	15.7	234	-7.8	407.9	43.6	206.8	57.4	94.8	31.4	15.3	0.7	-0.4	0.4
5	20.2	234	-3.3	406.4	46.7	207.3	59.3	94.6	32.0	15.2	0.7	-0.4	0.4
6	24.7	234	1.1	399.9	41.5	199.7	49.6	90.7	27.4	15.2	0.7	-0.4	0.4
7	29.2	234	5.5	392.3	36.0	188.1	41.4	85.0	23.6	15.2	0.7	-0.4	0.4
8	33.7	234	10.0	384.9	36.5	176.7	43.5	80.0	25.3	15.2	0.7	-0.4	0.4
9	38.2	220	14.3	381.6	43.1	170.5	49.9	78.6	29.6	15.2	0.7	-0.4	0.4
10	42.8	214	18.9	377.2	47.0	164.5	50.5	77.6	31.1	15.2	0.7	-0.4	0.4
11	47.2	214	23.3	369.4	42.1	159.2	43.8	76.1	27.9	15.2	0.7	-0.4	0.4
12	51.7	215	27.7	362.7	36.1	160.7	37.9	77.6	23.8	15.2	0.7	-0.4	0.4
13	56.3	210	32.2	354.1	28.9	163.6	31.3	79.5	18.6	15.2	0.7	-0.4	0.4
14	60.8	215	36.6	340.0	18.6	161.0	21.9	78.4	12.7	15.2	0.7	-0.4	0.4
15	65.3	214	41.0	320.0	12.5	151.9	16.7	74.1	9.3	15.2	0.7	-0.4	0.4
16	69.8	215	45.4	296.8	12.9	140.2	15.1	68.7	7.8	15.2	0.7	-0.4	0.4
17	74.3	212	49.7	269.1	15.1	123.3	12.3	61.0	6.1	15.2	0.7	-0.4	0.4
18	78.8	216	54.1	237.3	17.0	100.7	9.9	50.7	4.7	15.2	0.7	-0.4	0.4
19	83.3	213	58.4	205.1	16.3	76.6	8.7	39.8	4.2	15.2	0.7	-0.4	0.4
20	87.7	213	62.6	177.0	13.7	55.0	7.2	29.9	3.7	15.2	0.7	-0.4	0.3
21	92.2	214	66.8	153.6	11.6	37.2	5.3	21.2	3.0	15.2	0.7	-0.4	0.3
22	96.7	213	70.8	137.5	9.6	24.8	3.3	14.5	1.6	15.2	0.7	-0.4	0.4
23	101.2	215	74.5	133.1	9.1	16.9	2.0	11.0	1.1	15.2	0.7	-0.4	0.3
24	105.7	214	77.8	129.8	8.2	10.9	1.6	7.8	1.0	15.2	0.7	-0.4	0.4
25	110.2	215	80.1	125.9	6.8	6.1	1.2	4.7	0.9	15.2	0.7	-0.4	0.3
26	114.7	214	80.6	122.3	5.9	2.6	0.9	2.1	0.7	15.2	0.7	-0.4	0.4
27	119.2	211	79.1	119.9	5.8	0.5	0.4	0.4	0.3	15.2	0.7	-0.4	0.4
28	123.7	214	76.3	118.6	6.7	0.0	0.0	0.0	0.0	15.2	0.7	-0.4	0.4
29	128.3	231	72.7	119.1	7.4	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
30	132.8	230	68.8	120.0	8.2	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
31	137.2	234	64.7	122.1	8.6	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
32	141.7	223	60.5	125.9	8.7	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
33	146.2	195	56.2	130.4	10.0	0.0	0.0	0.0	0.0	15.4	0.7	-0.4	0.3
34	150.8	202	51.9	133.9	11.7	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
35	155.2	206	47.5	138.9	13.7	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
36	159.7	214	43.2	145.7	14.4	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
37	164.2	214	38.8	151.5	14.1	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
38	168.8	210	34.3	158.9	13.6	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
39	173.3	217	29.9	167.8	12.4	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3
40	177.6	215	25.4	175.8	11.9	0.0	0.0	0.0	0.0	15.3	0.7	-0.4	0.3

Figure 18 DELMAT Daily Solar Zenith Angle Band Averages.

58847	4178	-9934	6607	0	2915	1309	654	163	1	0	0	-86	0	0	0	30
58863	4268	-9961	6700	0	2872	1294	647	163	1	0	0	-86	0	0	0	30
58879	4358	-9990	6792	0	2829	1281	640	163	1	0	0	-85	0	0	0	30
58895	4448	-10018	6884	0	2784	1266	635	163	1	0	0	-85	0	0	0	30
58911	4538	-10048	6977	0	2739	1251	628	163	1	0	0	-84	0	0	0	31
58927	4628	-10079	7069	0	2693	1237	620	163	1	0	0	-83	0	0	0	31
58943	4718	-10110	7162	0	2642	1217	610	163	1	0	0	-82	0	0	0	31
58959	4808	-10143	7254	0	2591	1197	599	163	1	0	0	-81	0	0	0	31
58975	4897	-10178	7346	0	2533	1172	589	163	1	0	0	-80	0	0	0	31
58991	4988	-10212	7440	0	2477	1147	575	163	1	0	0	-78	0	0	0	32
59007	5077	-10249	7532	0	2420	1117	560	163	1	0	0	-77	0	0	0	32
59023	5166	-10286	7624	0	2362	1085	544	163	1	0	0	-76	0	0	0	32
59039	5256	-10326	7717	0	2303	1053	527	163	1	0	0	-74	0	0	0	32
59055	5344	-10367	7809	0	2244	1014	511	163	1	0	0	-73	0	0	0	32
59071	5433	-10410	7901	0	2187	978	493	163	1	0	0	-72	0	0	0	33
59087	5522	-10455	7994	0	2125	939	475	163	1	0	0	-71	0	0	0	33
59103	5611	-10502	8087	0	2066	894	456	163	1	0	0	-69	0	0	0	33
59119	5699	-10550	8179	0	2007	853	434	163	1	0	0	-68	0	0	0	33
59135	5787	-10603	8271	0	1947	807	413	163	1	0	0	-67	0	0	0	33
59151	5875	-10656	8364	0	1888	758	393	163	1	0	0	-66	0	0	0	34
59167	5963	-10713	8456	0	1825	711	372	163	1	0	0	-65	0	0	0	34
59183	6051	-10773	8549	0	1763	666	350	163	1	0	0	-64	0	0	0	34
59199	6138	-10836	8641	0	1704	620	329	163	1	0	0	-63	0	0	0	34
59215	6225	-10903	8734	0	1651	575	307	163	1	0	0	-62	0	0	0	34
59231	6311	-10974	8826	0	1596	530	288	163	1	0	0	-61	0	0	0	35
59247	6397	-11049	8918	0	1544	490	271	163	1	0	0	-60	0	0	0	35
59263	6484	-11128	9012	0	1493	455	253	163	1	0	0	-58	0	0	0	35
59279	6569	-11214	9104	0	1440	416	236	163	1	0	0	-57	-6	-3	-1	35
59295	6653	-11305	9196	0	1390	382	218	163	1	0	0	-56	-12	-4	-4	35
59311	6738	-11401	9289	0	1343	350	202	163	1	0	0	-54	-17	-7	-6	35
59327	6821	-11506	9381	0	1299	321	186	163	1	0	0	-53	-22	-11	-8	36
59343	6905	-11618	9474	0	1260	296	171	163	1	0	0	-52	-33	-15	-12	36
59359	6986	-11739	9565	0	1228	273	158	163	1	0	0	-51	-38	-20	-15	36
59375	7068	-11870	9659	0	1209	252	148	163	1	0	0	-50	-40	-21	-17	36
59391	7148	-12012	9751	0	1201	232	141	163	1	0	0	-49	-49	-26	-18	36
59407	7227	-12166	9843	0	1200	215	135	163	1	0	0	-48	-40	-29	-20	37
59423	7305	-12333	9936	0	1202	198	129	163	1	-2	-1	-47	-56	-33	-22	37
59439	7381	-12517	10028	0	1203	182	123	163	1	-4	-2	-47	-53	-38	-34	37
59455	7456	-12717	10121	0	1205	167	117	163	1	-8	-4	-46	-48	-43	-65	37
59471	7528	-12937	10213	0	1203	153	110	163	1	-12	-7	-46	-48	-47	-99	37
59487	7598	-13180	10305	0	1203	140	104	163	1	-18	-10	-45	-53	-56	-114	37
59503	7666	-13446	10398	0	1203	127	97	163	1	-24	-14	-45	-59	-62	-122	38
59519	7730	-13740	10490	0	1202	115	90	163	1	-32	-18	-44	-70	-85	-132	38
59535	7792	-14065	10583	0	1202	104	83	163	1	-40	-22	-44	-80	-132	-140	38
59551	7848	-14421	10675	0	1201	93	77	163	1	-49	-28	-43	-95	-173	-144	38
59567	7900	-14812	10767	0	1200	83	70	163	1	-59	-33	-43	-115	-202	-151	38
59583	7947	-15240	10860	0	1199	73	63	163	1	-69	-40	-43	-141	-223	-161	38
59599	7987	-15704	10952	0	1198	64	56	163	1	-81	-46	-42	-181	-239	-175	38
59615	8020	-16203	11045	0	1197	56	50	163	1	-93	-53	-42	-241	-280	-191	38
59631	8046	-16732	11137	0	1196	48	43	163	1	-105	-61	-42	-376	-328	-205	38
59647	8063	-17286	11230	0	1194	40	37	163	1	-118	-69	-42	-610	-376	-223	38
59663	8071	-17854	11322	0	1194	34	31	163	1	-132	-77	-42	-952	-419	-250	38
59679	8071	17574	11414	0	1193	27	26	163	1	-146	-86	-42	-1684	-642	-441	38
59695	8061	17006	11507	0	1192	21	20	163	1	-161	-95	-42	-3142	-1385	-971	38
59711	8042	16457	11599	0	1192	16	16	163	1	-176	-104	-42	-5264	-2733	-1819	38
59727	8016	15932	11692	0	1191	12	11	163	1	-192	-114	-42	-7041	-4477	-2578	38
59743	7981	15438	11784	0	1191	8	8	163	1	-208	-124	-42	-7935	-5767	-2995	38
59759	7940	14980	11877	0	1192	5	5	163	1	-225	-135	-42	-8190	-6305	-3148	38
59775	7892	14559	11969	0	1192	2	2	163	1	-235	-141	-42	-3072	-2415	-1578	38
59791	7840	14172	12061	0	1193	1	1	163	1	-223	-137	-43	-26	27	16	38
59807	7782	13822	12154	0	1195	0	0	163	1	-212	-132	-43	1	41	30	38
59823	7720	13503	12246	0	1196	0	0	163	1	-202	-128	-43	2	32	26	38
59839	7656	13213	12338	0	1198	0	0	163	1	-192	-124	-43	4	26	22	38
59855	7587	12951	12431	0	1198	0	0	163	1	-183	-120	-44	-2	23	18	37
59871	7517	12713	12523	0	1197	0	0	163	1	-174	-116	-44	1	16	15	37
59887	7444	12495	12616	0	1196	0	0	163	1	-165	-112	-44	1	12	11	37
59903	7369	12298	12708	0	1194	0	0	163	1	-157	-108	-44	-1	9	9	37
59919	7293	12118	12800	0	1192	0	0	163	1	-150	-105	-45	-3	6	9	37
59935	7215	11952	12893	0	1189	0	0	163	1	-142	-101	-45	1	4	5	37
59951	7136	11800	12985	0	1188	0	0	163	1	-135	-98	-45	0	-1	4	36
59967	7055	11660	13078	0	1184	0	0	163	1	-129	-95	-45	0	-3	3	36
59983	6974	11532	13170	0	1181	0	0	163	1	-122	-92	-46	0	-3	3	36
59999	6892	11411	13262	0	1177	0	0	163	1	-116	-89	-46	0	-6	2	36
60015	6809	11301	13354	0	1177	0	0	163	1	-111	-86	-46	0	-6	1	36
60031	6726	11198	13446	0	1170	0	0	163	1	-105	-83	-46	0	-10	0	35
60047	6641	11101	13539	0	1165	0	0	163	1	-100	-80	-47	0	-10	0	35
60063	6556	11012	13632	0	1162	0	0	163	1	-95	-78	-47	0	-10	0	35
60079	6472	10928	13723	0	1155	0	0	163	1	-91	-75	-47	0	-10	-1	35
60095	6385	10848	13816	0	1152	0	0	163	1	-86	-73	-47	0	-14	-1	35

Figure 19 MAT First Observation plus Filled Data Gaps

xi. Channel 13 shortwave heating correction in W/m^2 (x10).

xii. Channel 14 shortwave heating correction in W/m^2 (x10).

xiii. Channel 13 longwave heating correction (in W/m^2 (x10).

xiv. Channel 12 clipping correction. (in W/m^2(x10))

xv. Channel 13 clipping correction. (in W/m^2(x10))

xvi. Channel 14 clipping correction. (in W/m^2(x10))

xvii. Latitude band number (1-40).

x. Comments during writing of this days PDELTA tape file. The two numerical values on each line will differ only in the case of "gap encountered." In each case the first value is the current PDELTA observation time and the second is the next valid MAT time. "GAP ENCOUNTERED" indicates that artificial values created by the PDELTA algorithm have been encountered and they correctly have not been written to the PDELTA tape. (See Figure 20).

y. Summary of the observations written to the PDELTA tape. This figure should match the total in k) above. (See Figue 21).

z. Comment on the success of this MAT day's processing (see Figure 21).

aa. Echo print of table file after this MAT day's processing is complete. (See Figure 21).

bb. Comment on the success of this run's (one or more MAT day's) processing. (See Figure 21).

3.3.2 DELMAT

The DELMAT output consists of the DELMAT tape. Printed output is also produced, itemized below:

a. Output header information (see Figure 22).

b. Data file echo print. (See Figure 22).

c. Echo print of the Table File. (See Figure 22).

d. Number of PDELTA files indicated on the Table File. (See Figure 22).

e. The following information is repeated for each of the PDELTA files processed (each corresponding to one MAT day) to be merged.

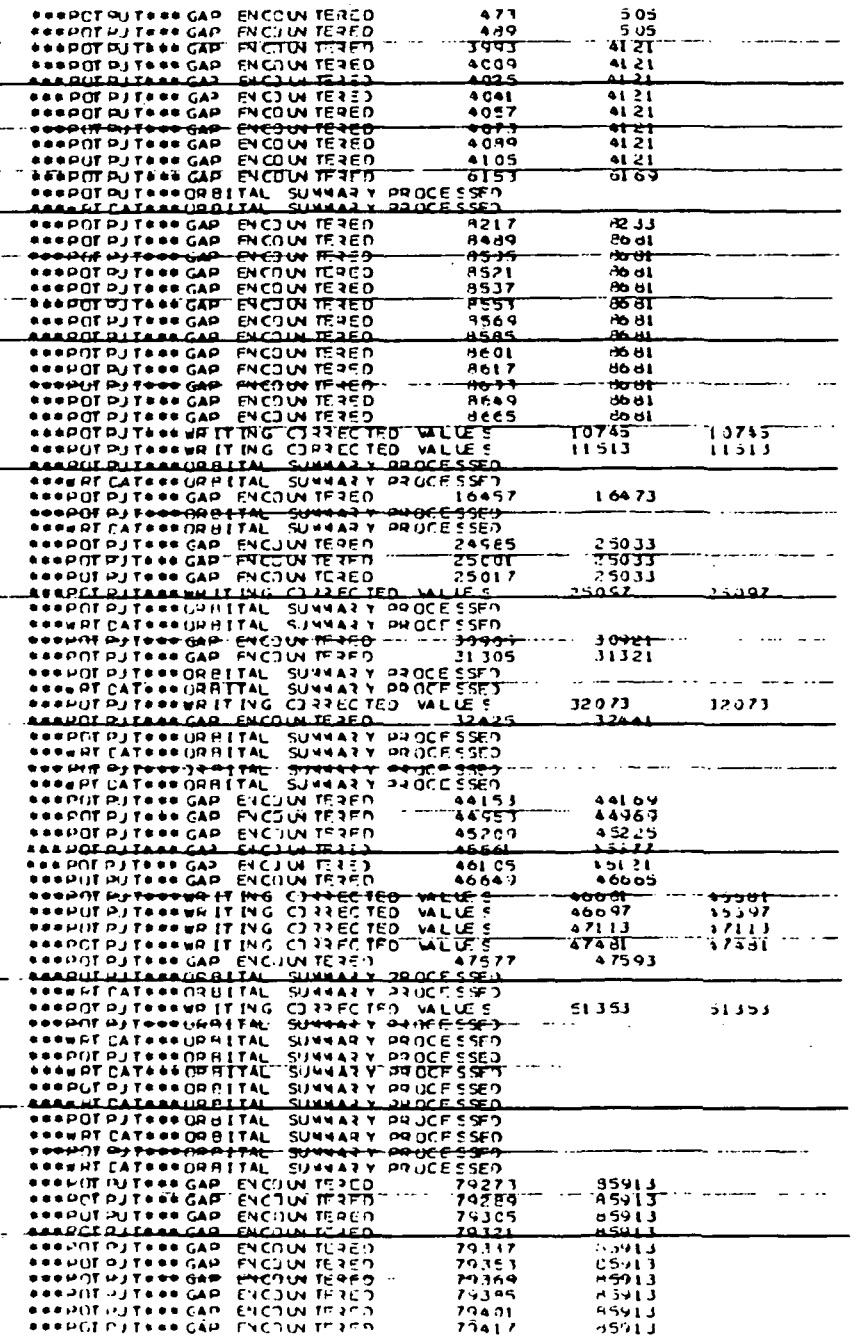

Figure 20 PDELTA Tape File Comments

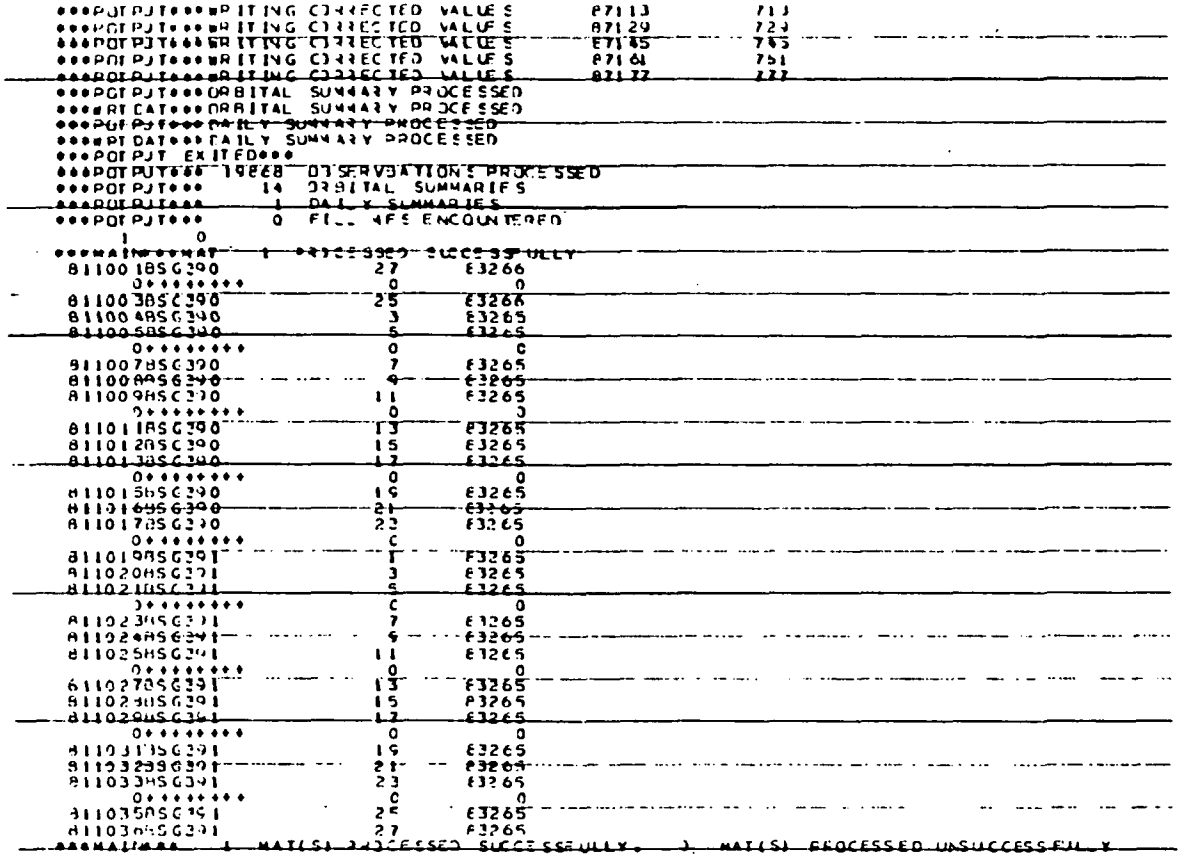

Figure 21 Success of MAT Day Processing

i. TDF information for the MAT day. (See Figure 22).

ii. For each physical record in a PDELTA file, the following information is provided. (See Figure 23).

1. Statement indicating the record has been processed.
2. A listing of the number and type of logical records encountered in the physical record.
3. A check describing the setting of the most significant and the least significant continuation bit of the record.

iii. A summary describing the number of various types of logical records encountered for the day. A dummy record is a blank record used to fill the last physical record. (See Figure 23).

f. A compilation of the DELMAT TDF. (See Figure 23 & 24).

g. A statement indicating that the TDF record has been written to the DELMAT tape. (See Figure 24)

h. A statement indicating that the DELMAT program is complete. (See Figure 24).

```
**********************************************
*  N I M B U S - 7    E R B    D E L T A     *
*                                            *
*          DELMAT   - MERGE RUN              *
*  VERSION  3.1 LAST MODIFIED ON 05.10.85    *
*          VERSION NAME  VER85130            *
*             ALGORITHM ID    5              *
*        CALIBRATION SET NUMBER    1         *
*  RUN DATE 18.37.51.18 WED MAR 12,1986      *
**********************************************


                    INPUT CARD IMAGES

         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
********************************************************************************
1*BSG401   50911  8504                                              00000010*  1
********************************************************************************
12345678901234567890123456789012345678901234567890123456789012345678901234567890
         1         2         3         4         5         6         7         8


'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''
' DATA WILL BE OUTPUT TO MONTHLY DELTA BSG401  SEQUENCE NUMBER 50911  FOR 8504 '
'''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''

                    PRELIMINARY DELTA FILE TABLE
 DAY    DATA DATE    OUTPUT VOLSER    FILE NO.    DATE CREATED
 ---    ---------    -------------    --------    ------------
   1      850401         BSG399           1         86067
   2      850402         BSG399           3         86067
   3      850403         BSG399           5         86067
   4      850404         BSG399           7         86067
   5      850405         BSG399           9         86067
   6      850406         BSG399          11         86067
   7      850407         BSG399          13         86067
   8      850408         BSG399          15         86067
   9      850409         BSG399          17         86067
  10      850410         BSG399          19         86067
  11      850411         BSG399          21         86067
  12      850412         BSG399          23         86067
  13      850413         BSG399          25         86067
  14      850414         BSG399          27         86067
  15      850415         BSG399          29         86067
  16      850416         BSG399          31         86067
  17      850417         BSG399          33         86067
  18      850418         BSG399          35         86067
  19      850419         BSG400           1         86069
  20      850420         BSG400           3         86069
  21      850421         BSG400           5         86069
  22      850422         BSG400           7         86069
  23      850423         BSG400           9         86069

  24      850424         BSG400          11         86069
  25      850425         BSG400          13         86070
  26      850426         BSG400          15         86070
  27      850427         BSG400          17         86070
  28      850428         BSG400          19         86070
  29      850429         BSG400          21         86070
  30      850430         BSG400          23         86070
  31      850431         BSG400          25         86070
  32      850432         BSG400          27         86070
  33      850433         BSG400          29         86070
  34      850434         BSG400          31         86070
  35      850435         BSG400          33         86070

  35 PRELIMINARY FILES WILL BE MERGED
*NIMBUS-7 MOPS SPEC NO T133101 SQ NO AJ50911 1 ERB  SACC TO SACC START 1985 091 000000 TO 1985 125 235959 GEN 1986 071 184028
DELMAT     VER85130 05.10.85  VERSION  3  .  1 ALGORITHM ID:    SCAL SET NO:      1


*NIMBUS-7 MOPS SPEC NO T133101 SQ NO AJ50911 1 ERB  SACC TO SACC START 1985 091 000000 TO 1985 125 235959 GEN 1986 071 184028
DELMAT     VER85130 05.10.85  VERSION  3  .  1 ALGORITHM ID:    SCAL SET NO:      1


********> THE TDF OF THE FILE TO BE MERGED NEXT IS FOLLOWING :
*NIMBUS-7 MOPS SPEC NO T134081 SQ NO AC50911-1 ERB  SACC TO IPD  START 1985 091 002428 TO 1985  94  11900 GEN 1985 176 033836

 *EST 16 03 16 84 CAL SET NO   4 09 14 79
```

Figure 22 DELMAT Echo Print of Data and Table Files

```
-------------------------------------------------------------------
HRTPDR : PHYSICAL RECORD   26 HAS BEEN COPIED TO THE OUTPUT TAPE
THE NUMBER OF RECORDS IT CONTAINS ARE AS FOLLOWS :
        199     LOGICAL DATA RECORDS
          1     ORBITAL SUMMARY RECORDS
          0     DAILY SUMMARY RECORDS
          0     FILL DATA RECORDS
          0     DUMMY DATA RECORDS
+ THE M.S.B. OF CONTINUATION BITS IS SET TO 0   THE L.S.B. IS SET TO 1
-------------------------------------------------------------------
HRTPDR : PHYSICAL RECORD   27 HAS BEEN COPIED TO THE OUTPUT TAPE
THE NUMBER OF RECORDS IT CONTAINS ARE AS FOLLOWS :
        200     LOGICAL DATA RECORDS
          0     ORBITAL SUMMARY RECORDS
          0     DAILY SUMMARY RECORDS
          0     FILL DATA RECORDS
          0     DUMMY DATA RECORDS
+ THE M.S.B. OF CONTINUATION BITS IS SET TO 0   THE L.S.B. IS SET TO 1
-------------------------------------------------------------------
HRTPDR : PHYSICAL RECORD   28 HAS BEEN COPIED TO THE OUTPUT TAPE
THE NUMBER OF RECORDS IT CONTAINS ARE AS FOLLOWS :
         63     LOGICAL DATA RECORDS
          1     ORBITAL SUMMARY RECORDS
          2     DAILY SUMMARY RECORDS
          0     FILL DATA RECORDS
        134     DUMMY DATA RECORDS
+ THE M.S.B. OF CONTINUATION BITS IS SET TO 1   THE L.S.B. IS SET TO 1

####################  END OF FILE   ####################

0000 MAIN: MERGE COMPLETE FOR  FILE  36 OF OUTPUT DELTA TAPE
 THE FILE CONTAINS :
      5450 LOGICAL DATA RECORDS
        14 ORBITAL SUMMARY RECORDS
         2 DAILY SUMMARY RECORDS
         0 FILL DATA RECORDS
       134 DUMMY RECORDS



##########NOPS TRAILER DOCUMENTATION FILE FOR TAPE PRODUCT T133101 GENERATED ON 1986 071 1840.


#NIMBUS-7 NOPS SPEC NO T133101 SQ NO AJ50911 1 ERB  SACC TO SACC START 1985 091 000000 TO 1985 125 235959 GEN 1986 071 1840
DELMAT     VER85130 05.10.85  VERSION  3  .  1 ALGORITHM ID:     SCAL SET NO:      1


#NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC50911-1 ERB  SACC TO IPD  START 1985 091 002428 TO 1985  94  11900 GEN 1985 176 0338
INGEST 16 03 16 84 CAL SET NO   4 09 14 79

#NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA50901-1 ERB  NOC  TO SACC START 1985 090 000604 TO 1985 097 003052 GEN 1985 173 0853
```

Figure 23 Information Provided by DELMAT Processing..

```
#NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA51251-1 ERB  NOC  TO SACC START 1985 125 002308 TO 1985 132 004756 GEN 1985 184 .
          TAPEGEN  VERSION  1.6

#NIMBUS-7 NOPS SPEC NO T134081 SQ NO AC51241-1 ERB  SACC TO IPD  START 1985 124 000444 TO 1985 127  10000 GEN 1985 255 2
INGEST 17 07 09 85 CAL SET NO   4 09 14 79

#NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA51181-1 ERB  NOC  TO SACC START 1985 118 014308 TO 1985 125 002340 GEN 1985 172 0
          TAPEGEN  VERSION  1.6

#NIMBUS-7 NOPS SPEC NO T123044 SQ NO LA03401-1 ERB  MDMS TO SACC START 1985 118 014308 TO 1985 125 002340 GEN 1985 172 0
          TAPEGEN  VERSION  1.6

#NIMBUS-7 NOPS SPEC NO T123044 SQ NO LA03411-1 ERB  MDMS TO SACC START 1985 125 002308 TO 1985 132 004756 GEN 1985 184 1
          TAPEGEN  VERSION  1.6

#NIMBUS-7 NOPS SPEC NO T113011 SQ NO UA51251-1 ERB  NOC  TO SACC START 1985 125 002308 TO 1985 132 004756 GEN 1985 184 1
          TAPEGEN  VERSION  1.6

********************  END OF FILE   ********************

********************  END OF FILE   ********************

MAIN: TDF WRITTEN TO DELTA OUTPUT FILE          37

@@@@@@@@@@@@@@@@@@@@ DELTA MERGE COMPLETE @@@@@@@@@@@@@@@@@@@@
```


Figure 24 DELMAT TDF and Completion Statement.

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TERMS AND ABBREVIATIONS

ERB - Earth Radiation Budget

WFOV - Wide Field of View

BPI - Bytes Per Inch

CAT - Calibration Adjustment Table

TDF - Trailing Document File

DELMAT - MAT Monthly Calibration Adjustment Tape

PDELTA - Preliminary MAT Calibration Adjustment Tape

JCL - Job Control Language

GSFC - Goddard Space Flight Center

SCF - Scientific Computing Facility

RDS - Research and Data Systems, Inc.

NET - Nimbus Experiment Team

APPENDIX A DESCRIPTION OF DELMAT STATUS WORD

The DELMAT status word is created internally during the operation of calibration adjustment software. It combines information from the MAT instrument status word, MAT data quality loss interval (DQLI) flags, interval irradiance quality control and gap filling procedures.

The units digit gives quality information on the uncorrected MAT WFOV irradiances and has 3 values:

0 - All WFOV data for channels 12-14 is good.
1 - All WFOV data for channels 13-14 is good.
All WFOV data for channel 12 is bad
2 - All WFOV data for channels 12-14 is bad.

The tens digit gives the cause of the problem:

0 - All WFOV data is good
1 - DQLI flags set
2 - Go/No GO heater is on.
3 - Electronic calibration is on.
4 - Channel 12 is shuttered.
5 - Channel 12 is narrow.
6 - WFOV data values are out-of-limits.
7 - WFOV data range check error
8 - Go/No Go Heater cool-down delay.

The hundreds digit described how the corrected WFOV channel 12 irradiances were computed (not written to the DELMAT tape):

0 - All WFOV channel 12 data is unchanged.
1 - All WFOV channel 12 data was replaced by interpolation.
2 - All WFOV channel 12 data was replaced with daily normalized zonal averages.

The thousands digit describes how the corrected WFOC channel 13 and 14 irradiances were computed:

0 - All WFOV channel 13 and 14 data is unchanged.
1 - All WFOV channel 13 and 14 data was replaced by interpolation.
2 - All WFOV channel 13 and 14 data was replaced with daily normalized zonal averages.

---

* The maximum minus the minimum irradiance in a major frame exceeds 20 W/m^2 and/or the major frame contains an observation which is more than 1 W/m^2 from a regression line through the 4 irradiance observations for the channel in the frame. This error check is not performed on solar-blip data and excludes major frames with a status word of 1-6 and 8.

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NASA CR 177874		

4. Title and Subtitle	5. Report Date
Nimbus-7 Delmat Operators Guide and Maintenance Manual	March 1986
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Lanning M. Penn, Philip E. Ardanuy	

9. Performing Organization Name and Address	10. Work Unit No.
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	13. Type of Report and Period Covered Contractor Report
12. Sponsoring Agency Name and Address Goddard Space Flight Center Greenbelt, Md. 20771	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This document describes in detail the ERB DELMAT algorithms used to correct the wide field-of-view channels (11,12,13 and 14) radiometer data. The computer software and the required operational environment are also delineated. The information and procedures required to maintain the DELMAT program are also described.

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